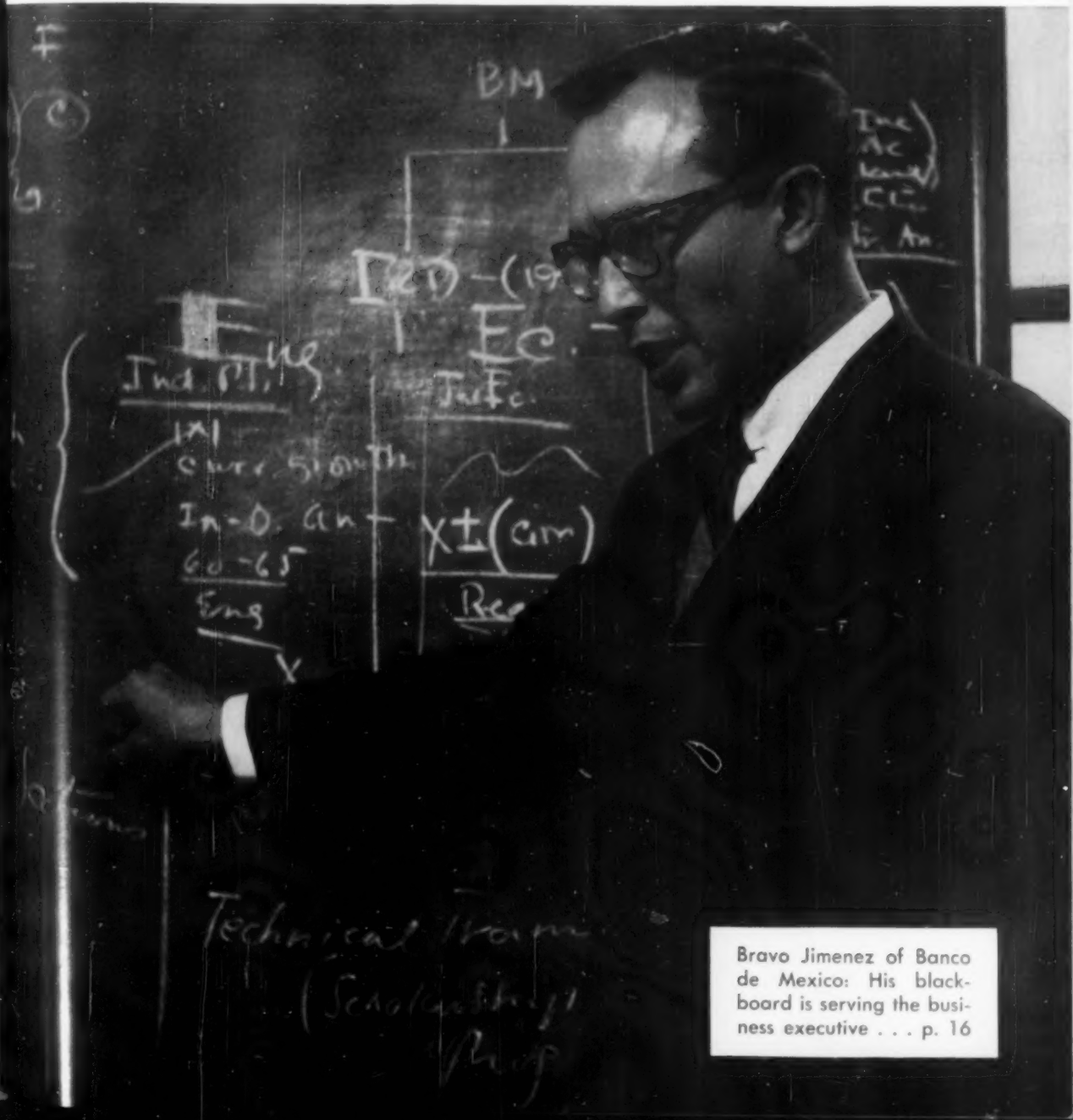
New Migration
U.S. Business Moves Abroad—p 12

International Management Digest®

MARCH 1959
ONE DOLLAR (U.S.)

THE McGRAW-HILL PUBLICATION OF WORLD BUSINESS INFORMATION



Bravo Jimenez of Banco de Mexico: His blackboard is serving the business executive . . . p. 16

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World Affairs

"Austeridad" Along the Plata

The Argentine stabilization program is beginning to bite. In January, the cost-of-living index in Buenos Aires rose nearly 15%—the largest single monthly increase yet.

This is a measure of President Frondizi's determination to extract "heroic" sacrifices from Argentines. It is also a measure of the extent to which they have been living in a fool's paradise of price control and consumer subsidy.

Prices will keep rising for some months if Frondizi has his way.

Like de Gaulle of France, the Argentine president is gambling on unpalatable reforms to restore solvency. Unlike de Gaulle, he inherited an economy nearing breakdown. He does not have the popular support that de Gaulle enjoys and his reforms—if anything—are more unpopular.

Will Frondizi make it? Despite ominous political unrest, many observers now give him a better than 50-50 chance of attaining stability. There is some progress in agriculture; the new petroleum policy appears promising; private foreign investors are showing new interest.

Officials of international financial agencies, and of the U.S. government, are backing Frondizi's effort and will continue to do so. They see Argentina providing a critical example of economic realism. That example is being watched carefully throughout the Americas—and the world.

Problems for Petroleum

Watch the petroleum industry. Events are in train that could affect businessmen everywhere.

Soviet bloc petroleum exports are rising—to 240,000 barrels a day last year, with more forecast for 1959. The sales campaign is intensifying in Europe, Africa, Latin America (with a special trial shipment even coming to the U.S.A.). Prices are low and "political," say industry men. It is clear that the Communists believe petroleum barter to be an important trade weapon.

Though there are limits to the amount of oil the Communists can spare now, the future may see a large increase, according to Petroleum Week magazine (as high as 2-million barrels daily by 1972 if the Seven Year Plan goals are reached). At the recent Communist Party Congress, the Kremlin told of vast new oil discoveries.

Venezuela's sudden increase in taxes on petroleum companies is already having an impact on output. One company is cutting back 1959 shipments, claiming that the tax makes its crude less competitive. Others threaten to reduce investment in Venezuelan facilities.

Meanwhile, all eyes are on next month's Arab Oil Conference. The big Western petroleum companies worry that the Middle East will be tempted to take a lead from Venezuela.

The historic voyage of the "Methane Pioneer," Louisiana to England with 33,000 barrels of liquid methane, could—in time—turn the petroleum industry upside down. That 33,000 barrels is the equivalent of 115-million cubic feet of gas. If the tricky shipping problem is indeed solved, it could

set off a minor boom in orders for special liquefied natural gas tankers and —more important—open huge markets in Europe and Japan, provide sharp competition for the established coal, petroleum, and gas industries.

A British Anti-Trust Policy?

More competitive conditions—leading to more company mergers—are likely in British industry.

That is the import of the recent judgment against a well-established price-fixing agreement among cotton spinners. It is the government's first such ruling in a price case, and might be the beginning of the end (or drastic modification) of many price rings and cartels.

Buying a Share in Europe

Note the steady broadening of West European securities markets.

More persons in more European nations can afford, and are buying, shares in companies and investment funds. The companies themselves are listing their shares on more continental stock exchanges. Thus these markets may be able to provide more of the new capital that European industry will need for modernization and expansion.

The buying is a sign of confidence in European economic growth.

This confidence is evidently shared by many North Americans: Wall Street reports a new rise in U.S. purchases of European securities.

Some of this investment is no doubt speculative. The price-earnings ratios of European industrial stocks, far below the recent high levels of U.S. stocks, appeal to the professional traders; moreover, convertibility makes it easier for them to move in and out of the market.

But many other Americans are convinced of the growth possibilities of the European market (page 12), are willing to place a long-term bet on the better-managed, more aggressive industrial organizations there. (Though they, like the speculators, might rush their money home in the event of a sudden war scare.)

A sign of the times: The New York Society of Security Analysts plans a European tour soon, to look over the prospects at close range. The analysts are especially anxious to peer (if they can) into accounting and financial reporting practices of European management.

Lesson from Leopoldville

Do not underestimate the significance of the recent riots in the Belgian Congo . . . and Brussels' reaction to them.

By emphasizing economic advance, Belgium hoped that the Congolese could for many years be insulated from Africa's drive toward political independence. That hope has vanished. By promising independence to the Congo, Belgium admits that the drive is irresistible.

For Belgian business, the handwriting is on the wall. In years ahead, Belgian companies will have to face much larger taxes on Congo profits; as more self-government approaches, they will lose much of their powerful say in Congo affairs. And they may see more non-Belgian foreign companies getting into the rich raw material sources and promising consumer market of the Congo.

The Congo shift will have a powerful effect on political trends in East, Central, South Africa—where the European, for the moment, still stands supreme.

modernization...

The Key to Lower Handling Costs

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(Above) Handles food cartons on pallets with speed and precision.

(Center) Climbs ramps easily.

(Right) The economical way to move heavy materials.

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239

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VOLUME 14 NUMBER 3

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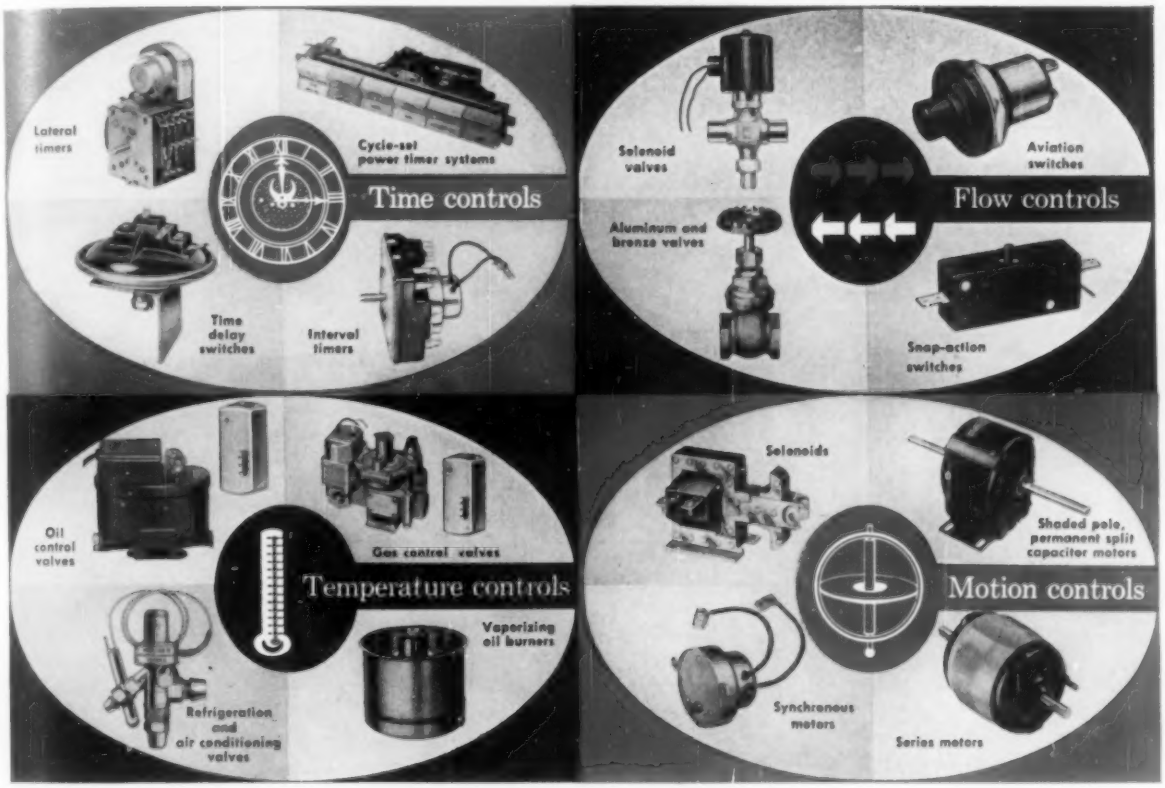

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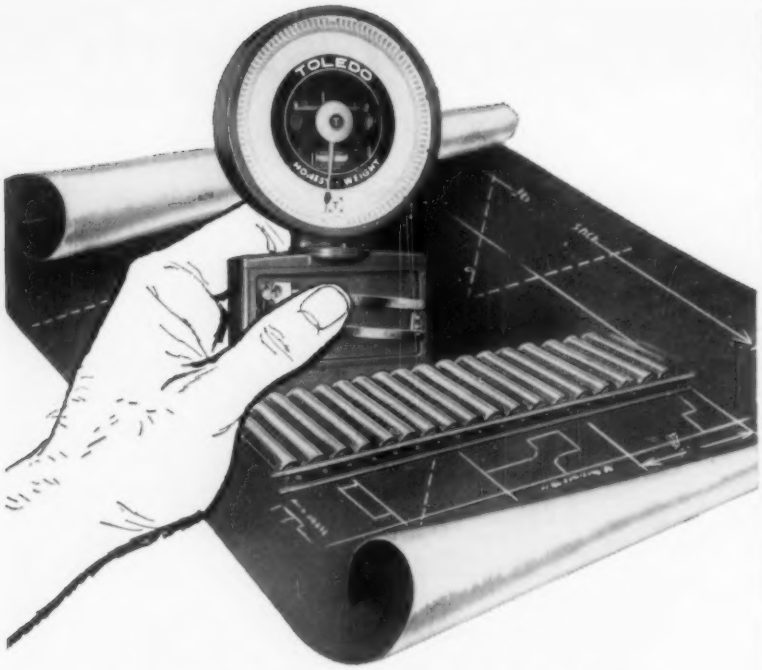

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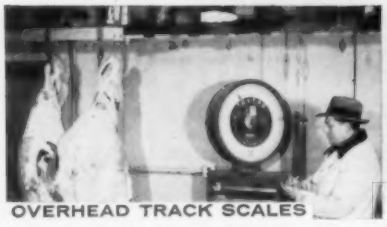

OVERHEAD TRACK SCALES

COUNTING SCALES

The Readers Report

Work Study

Sir . . . As subscribers to your magazine, we know that other readers are interested in methods of dealing with management problems. A bulletin entitled "Target," published in this country for the Ministry of Labour and concerned with productivity case studies, recently featured an article on the application of modern work study methods in our organization. The particular case study may be of interest to your readers, and we enclose two reprints.

M. A. Bud, Secretary
English Numbering Machines Ltd.
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Middlesex, England

● It is indeed interesting. Perhaps Mr. Bud will send a reprint to others who want to see how English Numbering Machines does it.—Editor

Mistake!

Sir . . . The digest of my article ("Graphs: An Important Tool for Management", IMD—January) was excellent—very concise and easy to read. But you may receive some questions on the graph that shows the seasonal sales pattern versus the work-day pattern. The printer evidently printed the blue line of the graph upside-down.

Thomas S. Dudick
Clifton, N. J.
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Congratulations!

Sir . . . Let me express my appreciation for including me as one of the subscribers to your valuable magazine. I consider it one of the best sources of informative data regarding international business.

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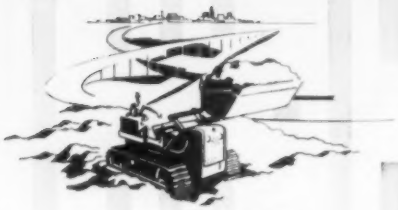

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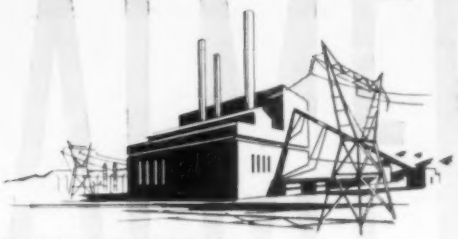

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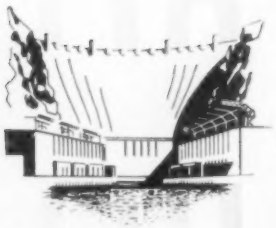

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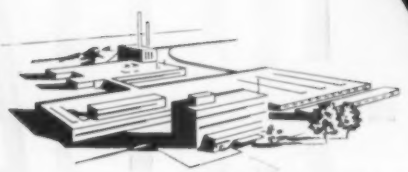

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A-5

What's Ahead for Raw Materials

If you want to make a bet on world raw material prices, bet on little change in the over-all index for the next eight months or so. Barring unforseen political events (Berlin?), there is nothing in the outlook that suggests a strong upward price trend soon. For while U.S. buying is up, businessmen elsewhere seem in no hurry to rebuild stocks. Supplies of food and fiber are heavy, and in early February prices were weak. Industrial metals and materials looked better—but not by very much.

Index of Commodity Prices: January 1956—January 1959

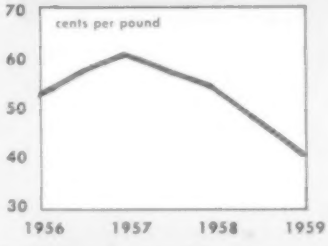
data: The Economist, London

average ingot (99% +), New York

◀ ALUMINUM

Slow demand, large supplies and excess capacity. No official price changes likely, but both ingot and products being discounted. Not as much Soviet metal expected in 1959.

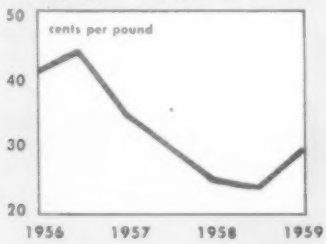
average spot Santos 4, N. Y.



COFFEE ▶

Little hope that price has stabilized in face of huge, still-mounting glut. Latin American market share dwindles; export quota agreement has not worked as expected —so far.

average spot electrolytic in New York



◀ COPPER

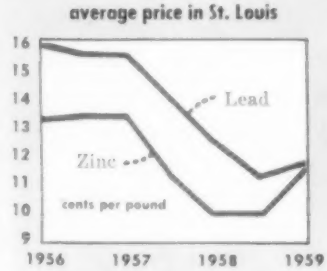
World supply and demand in fairly good balance; price relatively stable now. Output rising, but so is consumption. Watch U.S. for possible upward price pressure later.

American middling 1 inch c.i.f. Europe

COTTON ▶

World output may reach near-record 42.2-million bales, move ahead of lagging demand. Price-cuts will continue, especially if U.S.A. raises export subsidy—as expected.

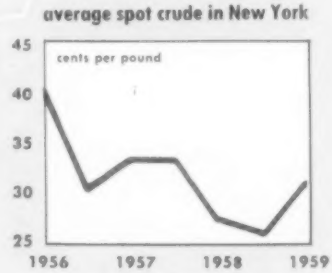
average price in St. Louis



◀ LEAD, ZINC

Lead is weakest nonferrous metal despite U.S. quota-protection; there's drastic oversupply. Zinc is stronger, present prices may hold. Watch UNO efforts to stabilize prices.

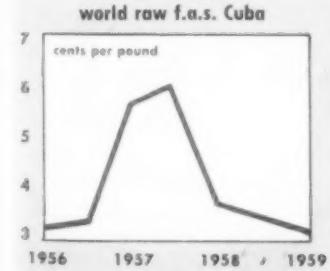
average spot crude in New York



RUBBER ▶

Use of natural rising; prices should stay firm. Fast growth of synthetic (European output up 200% by 1962) stimulates growers to push for higher yields, lower prices.

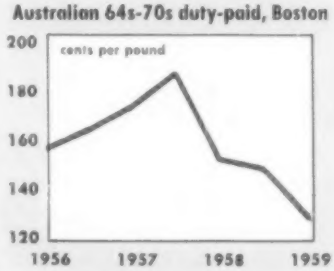
world raw f.a.s. Cuba



◀ SUGAR

World supply large; price near bottom. Watch Cuba: If crop is smaller than usual prices will move up sharply. Otherwise, expect fluctuations around present level.

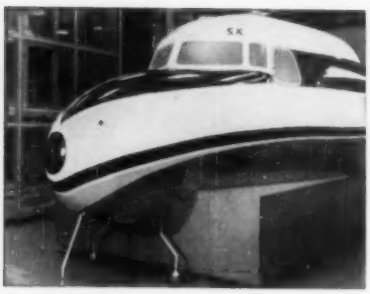
Australian 64s-70s duty-paid, Boston



WOOL ▶

Some rise in consumption expected, but wool stocks will probably rise too —so there is little hope for major price improvement. Problem: Synthetic fibers move up sharply.

Good Reasons for Flying *Royal*



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Latin Americans Search for Capital

They think they see some in the plan for an Inter-American bank. But there's an $850-million question: How much will the U. S. pay?

OVER THE PAST FEW MONTHS, Latin Americans' demands for a speedier rise in their living standards have increased to a thundering roar.

This is what has happened: The 1957-1958 recession in raw material prices revealed more clearly than ever the dangerous instability of many Latin economies. That price recession has hardly improved as yet (page 9). Growth in per capita output and income has almost ceased. It has become apparent to us, as one Latin American statesman recently put it, that "we cannot maintain healthy societies without breaking the present stalemate."

Like many of his colleagues, he is feeling terrific pressures — of explosive population growth; of political change, often drastic; and of the rising expectations of Juan Pueblo, Latin America's man-in-the-street.

• **U. S. Echoes**—Latin America's friends and trading partners (such as the Europeans, the Japanese) and would-be friends (the Communists) are noting these pressures. But no one is more aware of the situation than the U. S. A. Today, you hear American officials complaining that they do not have the time they thought they did to help "deal with the burgeoning growth in Latin America."

As a result, the U. S. government is focussing more directly on its southern neighbors, trying to be less rigid and more flexible in its policies. Important personalities are trying to "identify the U. S. A. with Latin aspirations." And because those aspirations generally involve money, the U. S. is now trying to increase the flow of capital to Latin America.

• **Minimum Growth**—How much and what kind of capital is the question. Some Latin Americans talk of thousands of millions of dollars of public money over the next decade, much of it to come from the U. S. A. Only with such amounts, these Latin Americans say, can the 20 republics hope to reach the yearly production growth rate of 4.5%, which they consider minimal. And when their North American cousins demur at some of the higher estimates, and suggest that development depends as much on a nation's internal policies as it does on the amount of capital from abroad, you get the state of mutual exasperation that so often characterizes inter-American economic relations.

The issue is now joined. Within the next three months, a committee of experts will lay before the hemisphere leaders the charter for an Inter-American Development Bank. By 1960, if all goes well, the bank will be operating—a milestone in pan-American relations.

• **Old Issue** — For years, Latin Americans have pressed for such a bank. They believe it can be Latin-oriented in a way that other institutions can never be. It could raise, channel, and coordinate capital in Latin America; it could be more *simpatico*, offering "somewhat more liberal terms" than the World Bank, for example.

For as many years, the U. S. A. has said No. "Somewhat more liberal terms," financial observers have said, could reduce such an institution from a solid bank to little more than a facade for a U. S. aid program.

Moreover, U. S. officials have thought that existing institutions are adequate. The World Bank (which is due to have its lending power increased) has made more loans to Latin America than to any other area, and the total amount of money—$904-million—is only slightly less than that received by Europe and by Asia. Furthermore, the U. S. A.'s own Export-Import Bank has added to its lending authority, mainly with Latin American loans in mind; the new Development Loan Fund will increasingly aid Latin projects.

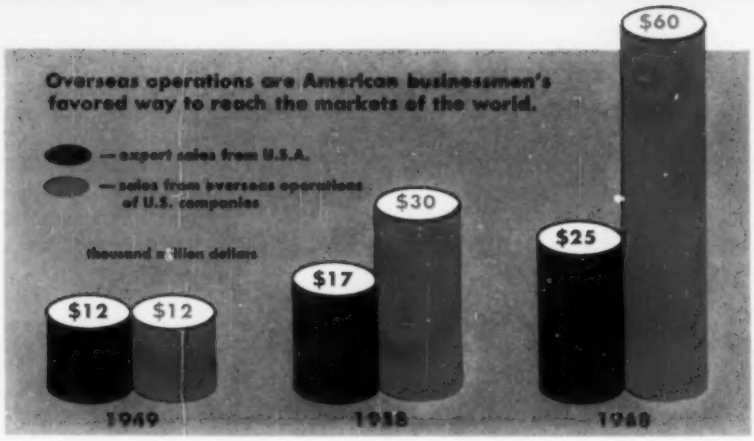
• **Political?** — Finally, in response to Latin pressures (and the recommendations of quite a few North Americans), the U. S. A. last year agreed to back the bank. The move was political, to be sure: It came shortly after Vice President Nixon's disastrous Latin tour. But while admitting the political angle, American officials also agree that properly managed, the bank could make a contribution. They do insist that nobody should expect "miracles"—and many thoughtful Latin Americans agree.

The disagreements are now under discussion. The U. S. A. has proposed an initial capitalization of $850-million, and would put up $400-million of the total. Loans would be made in both "hard" currencies and "soft." Class A stock, composed of hard money subscriptions, would total $700-million (U. S. share: $300-million); Class B stock would represent the soft currency component of $150-million (U. S.: $100-million).

The members would put up half their quotas at the start. Money flowing through the two bank "windows"—hard loans and soft—would be strictly segregated to protect the eventual marketability of bonds. A distinguished Latin American would run the bank, but voting on policy matters would be weighted—thus giving Washington a major voice.

• **More Money** — Last month, Latin Americans were pressing for larger capital, a larger U. S. subscription. There was some concern about the soft-loan feature—a few thought it might compete too much with the U. S. A.'s Development Loan Fund, thus divert capital that might have come to Latin America anyway.

Yet despite the differences an Inter-American Bank will probably come into being, roughly along the lines of the U. S. proposal. Then the test will begin. ●



The New Migrants: U.S. Industry Go

IN EVERY BUSINESS CENTER, you see evidence of a new phenomenon in the international economy—the overseas migration of American business.

Taxis, hotel lobbies, trains, planes and clubs in Europe and Latin America, in Asia and Africa, are filled with traveling Yankee executives. And in the U.S.A. itself, the luncheon-table talk among businessmen more and more comes round to international matters:

"It hasn't much to recommend it as a site for a new factory," you might hear an executive say. "But we are going to recommend that our company build one anyway. . . . These days you cannot afford to be the last one in a country."

"Americans have priced themselves out of world markets. The only ways to sell abroad now are to license a foreigner or invest in an overseas plant of your own."

"Our European operation is at least twice as profitable as our domestic business."

All the traveling and talk indicates that an old tradition is finally broken. For generations, American management has looked inwards at the U.S.A.'s own vast resources and markets. But in the last few years the outlook has changed—radically.

• **Ties that Bind**—The U. S. economy has become firmly attached to the outside world. It is not just because of the "cold war." Binding economic links have been forged by the huge dollar investment that private industry has poured into production abroad.

Today, "direct" investment (so called to distinguish it from investment in securities) far outweighs U. S. ownership of foreign shares and bonds. Sales of goods produced in U. S.-controlled plants outside the U.S.A. now far exceed the value of U. S. export sales.

• **Thousands Abroad**—Of the 100 largest U. S. industrial corporations, 99 are involved in one or another kind of overseas operations. All in all, at least 3,000 U. S. companies have money invested directly in foreign production and distribution. And working alongside them are scores of American engineers, consultants, banks.

Their investment in branches, subsidiaries, and affiliates outside the U.S.A. may be worth $50,000-million. There is no precise figure. The U. S. government estimates that American businessmen have invested $28,000-million directly abroad, up from $12,000-million in 1950—but that does not count operations where the U. S. ownership is less than 25% and it also reflects original plant cost, not present day value. Total earnings on that investment were about $3,000-million in 1957, much of it reinvested overseas.

This investment generates sales that probably totaled $30,000-million in 1958. Only a decade ago, such sales were about $12,000-million. In contrast, U. S. exports rose from $12,000-million to only $17,-000-million last year.

The contrast explains why many American executives now predict a doubling of sales from foreign operations in the next 10 years (charts above). At the same time they doubt that exports will increase by as much as 50%.

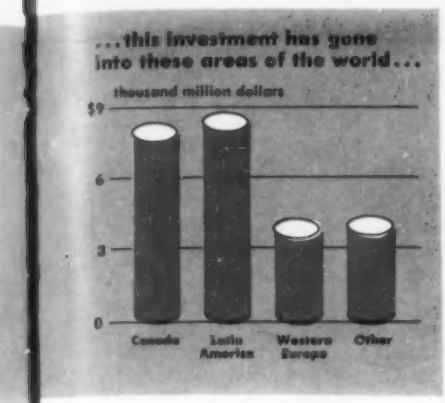
• **New Dimensions**—Behind all the new investment projects of Americans are cool profit calculations. The huge postwar flow of U. S. capital into Middle East, Canadian, and Venezuelan petroleum is by now an old story. The same is generally true of investment in iron ore, and non-ferrous metals.

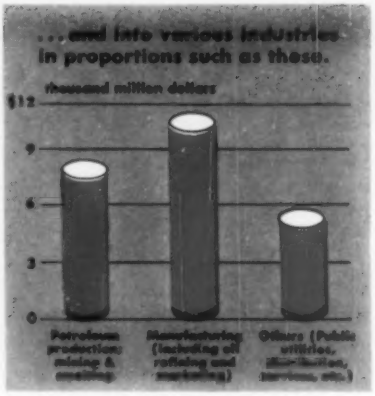
U. S. private investment in these extractive industries now totals some $8,000-million of book value—if you take official statistics and include that part of petroleum investment that can be attributed to production and transport (about 60%). And that $8,000-million may look small a few years from now. For investment in extractive industries tends to be self-sustaining, and is supported by European and U. S. raw material needs—which are constantly growing.

The total for manufacturing investment is $11,500-million if you include oil refining and marketing. Here there are other forces at work—the demand for American-type manufactured products in the consumer-oriented economies that have developed in Canada and Western Europe, are now appearing in Australia, Japan, and Mexico, and will soon develop all over Latin America.

Investment in other fields is relatively smaller, and does not grow so fast. In public utilities, for example, the 1957 total was $1,800-million. It is unlikely to expand much.

• **Stimulating Development**—These figures indicate that Ameri-





ry Goes Abroad

can private investment has become an economic "generator" on a global scale. Because it is becoming such an important factor in the "competition with Communism," the U. S. Congress is considering giving U. S. investors abroad more attractive tax incentives.

The migration of U. S. capital abroad is adding a new dimension to foreign economic policies at home. In the past, these were dominated wholly by export considerations. Now, with sales from overseas operations running larger—and growing faster—than exports, American industrialists have a more direct interest in political and economic stability in other nations. This, in turn, may be creating a new stability in U. S. tariff policy.

The kind of tough foreign competition that American industry is now facing in its domestic market would once have produced a sharp increase in U. S. tariff rates. That has not happened and is not likely to happen in the forseeable future—partly because so many American businessmen now realize that a broad move to raise U. S. tariffs would jeopardize their growing stake in overseas sales.

• **Jostling in Europe**—It is the manufacturers whose stake is now rising fastest, and who are most avidly seeking foreign investment.

In Europe, Americans are jostling each other, and Europeans, for a position in the Common Market area. U. S. postwar investment there has been concentrated in consumer goods, and in other products where Americans have had a development lead—such as autos, business machines, oil equipment, etc. But perhaps the biggest growth right now is coming in chemicals and electronics.

Whatever the area or the product, the basic aim is to hold a market position, or to find a new market.

Often overseas production investment gives a company a means of getting behind tariff or quota walls that shut out U. S. products. The start of Euromarket, for example, has provided a sense of urgency: Today you often hear this comment from Americans: "We have been planning this European investment for some time, but now we realize we cannot wait any longer."

In Latin America, import barriers and exchange restrictions are almost always a factor. And once they have established themselves in local production, many U. S. companies fight hard to get tariffs raised against imports from the U. S. A. or Europe.

• **Criteria**—American executives have developed some criteria to help them decide where and when to invest in a new plant abroad. First there has to be existing or potential demand. Possibly next in importance are government regulations on what capital equipment, materials, and parts they can import. Then there may be the problem of getting guarantees that profits and capital can be repatriated. Comparative production costs are also a crucial calculation. (For the results of a study of comparative unit production costs in several nations, see IMD, Feb., p 13.)

Building up sales has as much—perhaps more—fascination for the U. S. executives who head foreign operations as for any other businessmen. These men will tell you that a 5% addition to consolidated gross sales that might come from overseas operations often adds a much larger percentage to the company's overall profit margin. The foreign sales of some big U. S. corporations run to 50% or more of total sales and contribute more to profits than does domestic trade.

• **Always Problems**—But despite these attractions, the Americans do not find their business abroad without problems—ranging from getting adequate labor to buying quality components from subcontractors. Sometimes quality lags: A few regular European buyers of certain U. S. goods have taken a less than enthusiastic view of the same product when it is produced in an overseas plant, saying they would rather pay more to have the made-in-U.S.A. version shipped to them.

Occasionally, American companies run into nationalistic resentment; occasionally they run into unexpected local competitive situations.

In handling labor and labor unions, American companies believe their record is almost universally a good one. But they do not always find their relations with local business and government trouble-free.

In some nations, it is almost essential to join with a local company in a joint venture (IMD, Oct., p 18). That is true in India, and it is increasingly so in Latin America. Even in Europe, the joint venture is becoming more popular.

Some U. S. corporations refuse to accept the "partnership" idea. Such companies insist on operating through wholly-owned branches or subsidiaries. Other companies are more flexible, and may operate on a wholly-owned basis in one nation, on a majority basis in another, a minority interest in a third, and with a licensing arrangement in a fourth.

• **Not Too Much**—Finally, some U. S. executives with long foreign experience believe that it does not pay over the long-term for an American company to get more than 20% to 25% of the business done in their industry in a given country. These men point to Canadian resentment of the dominant positions American companies have won in some Canadian industries—and to the possibility that such a situation could develop in other countries. (*Business Week, Jan. 3, p 28*)

Fight Over British Metal

Banker S. G. Warburg (above) carried the day in the business battle of the century.

A NEW LINE-UP of world aluminum interests emerged in January—after one of the most heated battles ever witnessed in international financial circles.

The contestants: U. S. A.'s mighty Aluminum Co. of America, producer of a fifth of the world's aluminum, versus its biggest U.S. competitor, Reynolds Metals Co., joined with Britain's Tube Investments, Ltd. The prize: British Aluminium Co., Ltd.

By mid-January the battle had been resolved in favor of the team of Reynolds and Tube Investments, due to the suave negotiation of London investment banker Siegmund Warburg (picture above). Reynolds had cornered nearly 90% of BA stock, Alcoa had bowed out, British Aluminium was revising its management. Warburg had acquired new stature in world banking circles.

• **Search for Capital**—The battle for British Aluminium grew as much out of BA's need for new capital, as it did out of the designs of Alcoa or Reynolds. BA had been moving along sluggishly in recent years, its profits in 1957 barely above those of 1951. Though it accounted for 35% of the output of British aluminum products, it produces only 3% of world ingot, as compared with Alcoa's 21% and Reynolds' 14%.

To strengthen its position, BA three years ago formed Canadian British Aluminium Co., Ltd. It also, about the same time, found rich bauxite deposits in northern Australia and New Guinea. But both projects required money.

London's money market did not look too kindly on BA, in view of its unsensational progress and dividends. Across the Atlantic, however, Alcoa was looking for new sales outlets.

• **Alcoa Offer**—BA and Alcoa got together last June, and by November they had signed a contract under which Alcoa would buy BA's 4.5-million authorized but unissued shares at around $8.40 per share, close to the London market price at that time. Under the agreement, Alcoa promised never to exercise more than a third of the voting strength of BA—a concession that might quiet any popular fear of foreign control.

But Reynolds apparently had its eye on BA even earlier. In 1957, it took on Siegmund Warburg, a partner in the New York investment firm of Kuhn, Loeb & Co. and also a director of S. G. Warburg & Co., London, for help.

• **Reynolds Steps In**—Warburg made his first move late in 1957 by getting Reynolds to form a joint company with Tube Investments, Ltd. Tube Investments is a rapidly expanding holding company, operating through 50 affiliates that make everything from machinery to bicycles.

Early in 1958 Warburg began unobtrusively buying up BA stock. On October 28 he went to see Lord Portal and other BA directors. He told them that his clients now owned 1-million out of BA's 9-million shares. He asked for talks on "an association of interests."

Portal ignored this offer. His answer came indirectly a few days later, when a group of BA executives left for the U.S.A. for final talks with Alcoa. On November 14 BA signed its agreement with Alcoa—subject to Treasury approval.

• **Press Reaction**—The announcement caused a near riot in financial circles and the press. During final BA-Alcoa negotiations, Warburg and his clients had offered to buy all the BA stock, and leave the company's management unchanged. British Aluminium stock rose to new highs.

Financial writers, never too happy about the Alcoa deal, were further incensed when they learned about the offer made by Reynolds and Tube Investments—when private correspondence was published. Why, they asked, is Portal selling to Alcoa for $8.40 when market price is closer to $11.20? Why were not BA's stockholders informed that a higher offer had been made?

On December 4 the Treasury announced that it "was not ready to make a decision." This gave Warburg the time he needed.

• **Final Effort**—Portal, acting through bankers Lazard Bros., made a final and desperate effort to line up stockholders, appealing to "national interest" and making a new offer. But Warburg's clients continued to buy stock, and the price continued to go up. It finally was even beyond the Lazard bid. By January 7 Warburg had cornered over 50% of the stock, and a few days later, close to 90%.

Combining Forces

VENEZUELA has just provided a fine example of the "joint venture"—fast becoming a favorite mechanism of international investment (IMD, Oct., p18). Consider the case of "Cabel."

This new company, Industria Venezolana de Cables Electricos, began producing heavy cable in December at a new plant in Valencia. Cabel came into being some two years ago when Italy's big maker of tires, textiles and cables, Ceat Cavi S.p.A., became impressed with Venezuela's power needs and wealth of foreign exchange. Ceat turned for advice to an old U.S. associate, General Tire & Rubber Co.

General Tire not only gave its advice, it joined the venture. With some Venezuelan associates, it pledged about 19% of the capital.

• **More Partners.** Before Ceat had settled on a plant site, other

companies became interested in the project. U. S. A.'s General Cable Corp., which secretly had been planning on a Venezuelan cable factory itself, came in for about 27% of the venture. Then two British companies, British Insulated Callender's Cables, Ltd. and Telegraph Construction & Maintenance Co., provided another 27%.

Besides capital, the participating companies supply management and technical men. Cabel's chief executive officer comes from General Tire, its general manager from Ceat, most of its technical men from General Cable.

With no local competitor, Cabel's future appears assured. But ownership still may be reshuffled, as Venezuelan investors press for a larger share of the pie.

U. S. Researchers Abroad

U. S. INDUSTRY this year will spend some $200-million in exploiting scientific ideas and talent abroad. As an example, look at the projects of Smith, Kline & French, an American drug manufacturer—a new 40-scientist laboratory near London, a grant to South Africans studying drug-producing vegetation. These and others will be directed by W. Furness Thompson (picture), the company's vice president in charge of research.

"There's no monopoly of scientific discovery in the U. S. A.," says Thompson. The British excel at neurophysiology, he notes; the Germans at chemical synthesis, the French at physiology and pharmacology. His company, and others like it, are tapping an increasing number of these resources via grants, university contacts, overseas subsidiaries. (*Sources: Business Week, Jan. 17, Jan. 3, Jan. 10*)

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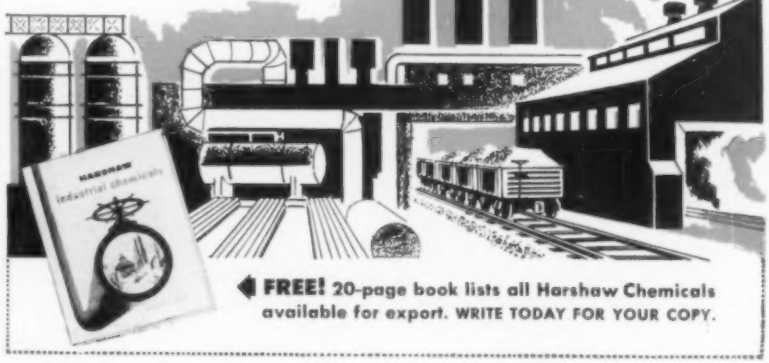

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Banco de Mexico's Manuel Bravo Jimenez (left, cover) is making business planning a reality. That is why Mexican managers say . . .

"Bravo," Senor Bravo

BUSINESS PLANNING is practically impossible without accurate, up-to-date economic reporting. And the simple gathering of business information is one of the biggest problems of many nations.

The problem is well-known. Many economists have written of it, many development seminars have discussed it. But what it means to the businessman has seldom been stated more eloquently than by Manuel Bravo Jimenez (above and cover picture), chief of the Banco de Mexico's pioneering Investigaciones Industriales:

"The manager lives with the constant problem of a choice of alternatives, groping through a mist of unimportant details and unreliable data in an effort to define the root of the problem."

• **Unearthing Roots**—Eloquence, however, is not Bravo's only talent: He is better known for his ability—to use his own analogy—for dispersing the mist over business, unearthing economic roots, and supplying reliable data.

In tribute to Bravo's data, a Mexican industrialist told an INTERNATIONAL MANAGEMENT DIGEST reporter: "It is the best information we can get—and it is usually accurate." Bravo's door is always open to businessmen seeking advice, and he often sits as an "extra member" on boards of directors.

Recognition is coming from outside Mexico, too. Next month, executives and government officials from all over Latin America will gather in Mexico City, on United Nations scholarships, to attend a six-month course in industrial economics—and how to gather vital statistics—taught by Bravo and his staff. They will learn how the Banco de Mexico's reporting system operates, and how it is helping businessmen.

Bravo Jimenez' department works closely with the bank's Economic Research Department, which supplies data on national income, banking statistics, economic trends. Bravo concentrates on industrial research. Under him is a staff of 35 economists and engineers, and 20 to 25 of them are usually in the field, "ringing doorbells" to gather fresh information for reports.

• **Familiar Face**—Bravo himself, now only 42, is already a familiar figure at inter-American conferences and regional discussions. He keeps in touch with other Latin American economists — Roberto Campos of Brazil's National Development Bank, for instance, and Argentina's Raul Prebisch—to exchange data, compare problems.

Bravo is especially proud that his department is the first economic reporting service in Latin America to apply the advanced analysis technique called input-output measurement (developed by Professor Leontief of Harvard University). By a complicated "matrix" technique, one industry's output becomes another's input, and the national economic structure is analyzed in detail.

One group concentrates on this work, and it projects the "current growth" trends to 1965. Another works on regional planning. A third concentrates on what Bravo calls "limiting factors."

• **Limits to Growth** — For the economy as a whole, the limiting factors are capital formation, income distribution, and technical education. From the department's studies, for instance, Bravo knows that only 15% of the nation's factories employ technicians; and of these technicians only one in five has adequate training in production, engineering, or industrial economics. He knows, too, that all of the technicians currently in training are needed in the plants that already employ technicians.

Some basic factors have been projected all the way to the year 2,000. Mexico will then have a population of 100-million (it is now 32-million). Ours is not an "expanding" economy, says Bravo, it is an "exploding" economy.

The ultimate limiting factor is a nation's human resources. Somehow, Bravo warns, the citizen of developing nations must be given "a mystique for the transformation, care and love of his environment: his land, its trees and its water, the family, the institutions in his community."

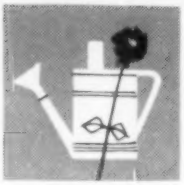
• **Special Studies** — Bravo's department does not put out regular reports or bulletins. Instead, it tackles each industry separately. Over 70 industries have now been studied; reports range from electric energy to the cactus liquor industry. These reports are made available for a nominal charge.

Publishing industry studies is the "first phase," Bravo says, and even as new industries are undertaken, his "door-bell ringers" are bringing older reports up-to-date.

But Bravo's department is perhaps best known for its informal advisory service. Many companies have come to rely on the Banco de Mexico for advice on expansion and diversification projects.

When businessmen come to his office, Bravo observes, they are usually in a frame of mind to listen. "But some become too emotionally involved in pet projects," he notes. He applies the same critical concept of limiting factors to an individual project as he does to the national economy. Is the plant site in a good location for the future? Will the market grow? Will supplies and raw materials be available? Is the time ripe for investment and expansion? ●

Only water needed



Travelling from Singapore to Europe, you may either take a plane if you are pressed with time, book a boat passage if waves don t scare you, or if you are the bold type, go by car. Mr. C. H. Pollock and his wife had courage, and a car. They were very bold even, figuring that they were pure innocents as to what makes an automobile go.

R.A.F. Major Pollock was a courageous man, but, just to be on the safe side, he stowed away a sparepart dealer's joy of accessories; however, he would have been at a loss to say which part would fit where. Then they set out for a trip full of adventure, passing the picturesque landscape of Malaya, beating their way through the damply jungles of Thailand, crossing the Burma plateau, traversing India, making their way through Pakistan and Afghanistan, and finally arriving in Germany after a long trip through Persia, the land of oil and fairy-tales. It had been a beautiful journey, though strenuous and dangerous at times. For miles and miles they went on roads that hardly deserved the name; and Major Pollock didn't feel exactly elated at the idea of camping in the desert, sitting in a broken down car. Nothing of the sort happened, and the Pollocks safely arrived in Germany after a trip of 18 000 miles. Their first idea was to have a few days of relaxation and to pay tribute to their faithful car by giving it a wonderful overhaul. After checking and rechecking the Mercedes-Benz 180 D (Diesel) and a thorough going-over from top to bottom, a mechanic in his matter-of-fact way said: "All your car needs is a good wash."

Now, Major Pollock is looking for somebody to buy a trunkful of some very important spareparts...

Market Shares: A Reliable Tool?

An understanding of its limitations can lead to better use of this measure of marketing.

MARKET-SHARE MEASUREMENT—the percentage of the total market enjoyed by a company's product—is a favorite technique of U. S. marketing managers. But there has been surprisingly little discussion of why this business tool is used and the assumptions behind its use.

In an attempt to start a much-needed debate, an American professor of marketing this year charged that its widespread use is due perhaps to "a general unawareness of its flaws as a managerial tool."

Professor Alfred R. Oxenfeldt of Columbia University, writing in the *Harvard Business Review* (Jan.—Feb., p 59), says that failure to maintain a given share of the market is not clear evidence of managerial deficiency, nor is an increase proof of managerial excellence.

• **Perspective** — Management's use of a market-share standard, Oxenfeldt notes, is based primarily on the belief that it isolates the influence of outside forces—recession, prosperity, shortages, price changes, shifts in demand, etc. It puts a sharp sales rise in perspective—for instance, if a competitor's sales have risen even more, the increase loses some of its savor.

What worries Oxenfeldt is the "implicit assumption" of market-share measurement that all companies in an industry are equally endowed, and that outside forces impinge equally on all. "This is an unacceptable assumption to anyone with a specialized knowledge of an industry," he says.

One danger: A market-share standard may result in mistaken evaluations of individual managers. It may also result in unwarranted actions to maintain a market share in the face of an inevitable decline.

• **Belated Signal** — At best, argues Oxenfeldt, a market-share change is a signal—generally belated and blurred—that difficulties have arisen or have been overcome. But changes cannot be interpreted mechanically: Market shares may shrink or expand for reasons wholly unrelated to management actions. New competitors might enter the market, old competitors might find other products more profitable.

And if market share is used as a primary goal, operating managers may lose sight of the more substantial objectives of the business. There is no perfect correlation between market share and profitability, Oxenfeldt observes.

Moreover, difficulties in measuring market shares weaken their reliability and delay recognition of the changes. Though some companies go to great expense in making surveys of consumer purchases, most depend on industry statistics compiled by trade associations or other agencies. In most cases, however, only sales to the middleman are recorded. If management is not alert, it may miss a build-up of inventories and remain complacent when decisive action is called for.

• **What Units?**—In some industries, too, it makes a great deal of difference whether market shares are computed in physical or monetary units. Even the direction of change can be distorted—particularly in industries where products are made in both low-price and high-price models.

But in spite of these limitations, Oxenfeldt concedes that market-share measurement must play a central role in diagnosing sales performance, because it "reveals how buyers have responded to the whole complex of actions taken by all firms in an industry."

"If the results are to be reliable and usable," he concludes, "one must investigate experience in individual markets, where the effects of any marketing policy are likely to reveal themselves quite sharply and with minimum distortion." ●

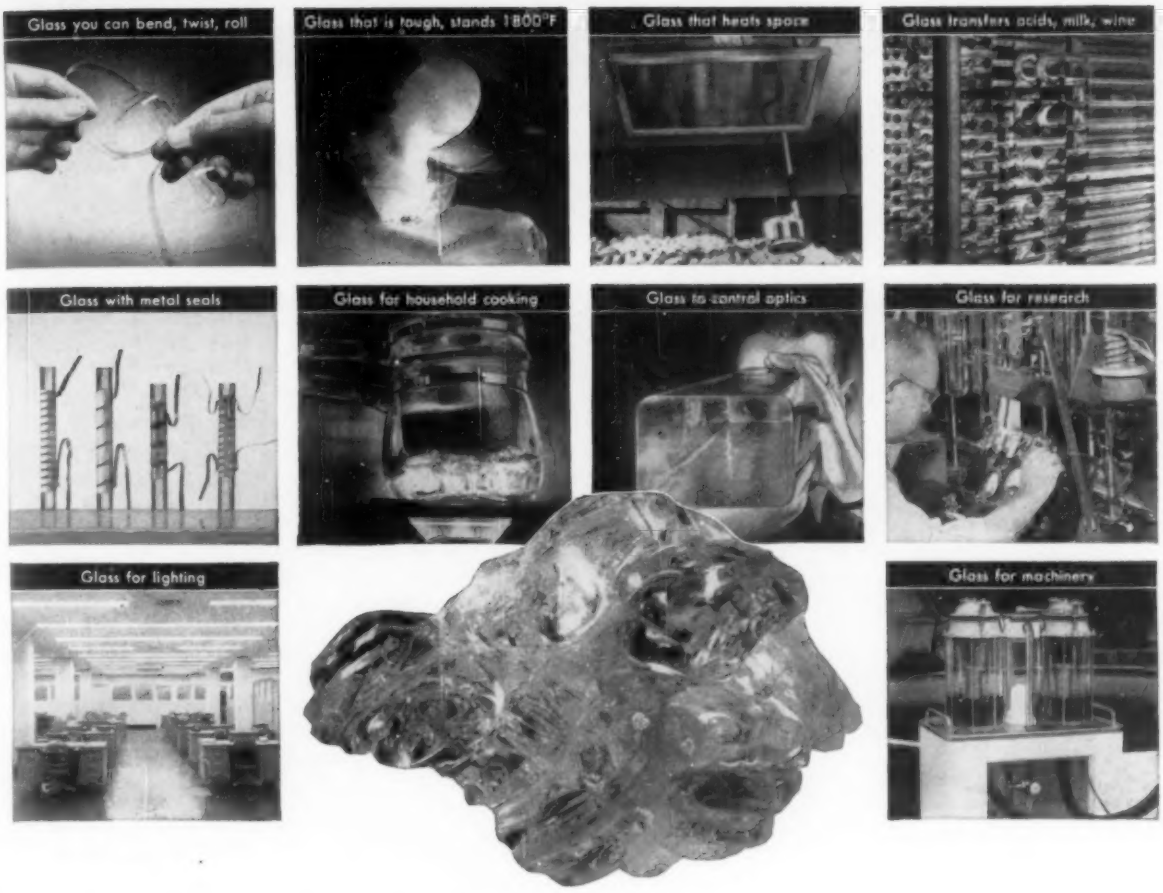
New Orleans "Trade Maker"

Mario Bermudez

"TO BE HELPFUL, we will do most anything," comments Mario Bermudez (above), director of international relations for New Orleans' International House, a non-profit business organization devoted to fostering trade between U. S. and foreign businessmen, particularly in Latin America.

International House got its start 13 years ago. A group of New Orleans businessmen decided to get together to prevent a tapering-off of trade through the Gulf of Mexico port after World War II. Since then, the organization has processed an estimated 500,000 requests for business leads and contacts in various parts of the world.

• **Clearing House** — Essentially, International House acts as a sort of a clearing agency for global traders and would-be traders. It gets involved in no monetary transactions; its chief function is putting people with things to sell in touch with people in the mood to buy. In the process, Mr. Bermudez often finds himself playing genial host, language teacher, cultural expert, broker (without commission), and generally a Good Man Friday. "Most anything" that he has done includes bringing together a Mr. Douglass of East Cleveland, Ohio, who breeds exotic birds, and Senor Boyekens of Buenos Aires, who exports Gould-


Glass you can bend, twist, roll
Glass that is tough, stands 1800°F
Glass that heats space
Glass transfers acids, milk, wine
Glass with metal seals
Glass for household cooking
Glass to control optics
Glass for research
Glass for lighting
Glass for machinery

MATERIAL PROBLEM?

...Glass by Corning may be your answer!

Glass by Corning can be fragile or tough, solid or porous, transparent or opaque. It is an insulator but can be made with an electrically conductive surface. It can be compounded to meet such specific problems as corrosion, heat, or abrasion. It can be made into many shapes such as cylinders, vessels, flatware, pipelines, household ware, jewel bearings, parts for appliances and machines, etc. *What's more, glass by Corning is available now and at low cost.*

In the hands of Corning technicians glass has been made to do all sorts of jobs. Over 50,000 glass formulae are catalogued. More than 400 different glasses are in current production. It has taken years of "research in glass" to produce these developments.

That is why Corning suggests that "you name it." Chances are that the characteristics you require will be within the vast framework described above. Corning engineers are well qualified to determine the feasibility of any design or to recommend changes that will permit a satisfactory solution to the problem. As a starter, why not send for the booklet "This is Glass," which illustrates countless ways glass is being used in industry and home today.

CORNING means research in GLASS

Please send me a copy of "This is Glass"

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Export Sales Dept. A-3
717 Fifth Avenue, New York 22, N. Y., U. S. A.

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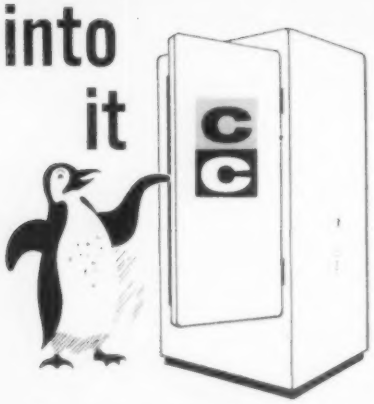
25Y

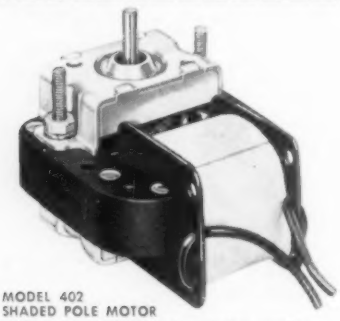
Look into it



for every refrigeration control need

Rely on Controls Company of America's extensive experience with all types of refrigeration controls. Hundreds of standard units are available for immediate selection . . . for virtually unlimited application. Write today for complete catalog data.

MODEL 207C THERMOSTATIC EXPANSION VALVE—Adjustable superheat. R-12, R-22 or Methyl. Capacity: ¼ thru 1½ tons R-12. A complete line of these valves are available in capacities from ¼ to 25 tons, R-12.



MODEL 402 SHADED POLE MOTOR
— Exclusive camel bearing design results in extra long life. Range of 7 models covers any refrigeration air circulation application.

CONTROLS COMPANY OF AMERICA
International Division
Schiller Park, Illinois, U. S. A.
CONTROLS AG: ZUG, SWITZERLAND

ian finches. Mr. Douglass's testimony: "Beautiful birds, promptly sent, nicely packaged."

International House also found a buyer for 10,000 small alligators from Dutch Surinam. But when a Spanish senorita hotly pleaded for help in finding a husband—"tall, rich, and handsome"—she got a cool reception.

Not long ago, the president of a Central American country unofficially asked International House officials about efforts to stimulate trade in the area. A fact-finding trip and personal, informal talks with presidents of four other countries helped produce a series of economic conferences with a potentially wide impact on trade in Central America.

International House also regularly sponsors "goodwill" missions to and from the U. S. A. and other lands. It publishes a bi-monthly bulletin called "The Trading Post," in which businessmen from various parts of the world can make their wares known. It also cooperates with the International Trade Mart, a sister organization, in promoting product exhibitions.

• **Intangible**—And in addition to dispensing knowledge and know-how, International House exploits one intangible but highly valuable asset: "We can go where diplomats would not dare tread," states Bermudez. "If there is a lot of red tape in a deal, we can often get it cut. We go directly to the man who can say 'yes' or 'no'."

International House operates without taxpayers' money, except for a token $5,000 to $10,000 annual contribution from the State of Louisiana. Membership dues from its more than 2,500 businessmen members last year contributed an estimated $250,000 for operating expenses. Its directors—more than 100 prominent New Orleans businessmen—receive no pay; a small professional staff handles day-to-day operations.

The fame of International House is spreading in the world—and among U.S. cities. Philadelphia has sent a delegation to study its operations. Houston is raising money to start its own International House. And Boston and San Francisco already have programs patterned after International House. (*Wall Street Journal, Jan. 8, p1*)

Japan's Zaibatsu Are Back—With Emphasis on Marketing

JAPANESE INDUSTRY has come full circle in its export plans since prewar days. The *zaibatsu* trusts are back, but with an aim of conquering the world through high-quality products rather than militarism.

Proof: The exhibition center recently opened in downtown Tokyo by Mitsubishi for its 23 affiliated companies. Spread out over 72 square meters of floor are the latest Mitsubishi products—mainly machinery and art goods—designed to interest buyers from Europe and elsewhere.

• **Must Compete.**—Japanese exporters must compete with European companies if they are to survive, says Takeo Nishizawa, manager of the new Mitsubishi showroom. But to do so, they must compete in Europe's home markets as well as overseas.

What is required, says Nishizawa, is a concerted effort by big firms like Mitsubishi, in line with the program for small industries' exports now supported by the Japanese government. Only with such joint effort can Japanese exporters counter local trade alliances overseas and avoid suicidal competition among themselves.

The Tokyo showroom is a first step. Showrooms overseas—especially in Europe—may come later for Mitsubishi.

And the manufacturers will also benefit from another trend—overseas branches of Japanese department stores. Takashima showed the way last year, with a successful opening on New York's Fifth Avenue; now Hankyu is planning to open in Los Angeles. Toyoko has signed a contract with Iran for a joint-owned store in Teheran; and four other department stores plan branches in Singapore, Kuala Lumpur—and in Europe itself.

In Marketing

LIQUID INSTANT COFFEE in pressure cans will soon be marketed in the U. S. A. With the present package, the consumer must measure the concentrate into a spoon before mixing it with water. But the processor is reportedly working on a measuring valve that would dispense the correct amount. The can must be refrigerated.

Another development in American coffee merchandising is the use of vacuum-packed cans in beverage vending machines. The cans act as disposable brewing chambers, with water being forced through holes in them. (*Food Engineering, Jan, p22*)

WEST GERMAN TOY MAKER Margarete Steiff GmbH. placed its stuffed toy animals in advertisements worth about $1-million last year—all for nothing. The animals were mostly used as "props" and scenery: In an advertisement for cat food, for instance, a real Persian whispers to a Steiff stuffed lion: "Just among us cousins—we cats need meat!"

Steiff also spent close to $50,000 on its own advertising campaign. The results: Sales of $1½-million in the U. S. A. last year, according to *Printers' Ink*.

MARKETING MANAGEMENT has "moved right into the center of the U. S. economic stage," observes McGraw-Hill Economist Dexter Keezer. At least one-third of U. S. production—particularly consumer durable goods—now is in the realm of "optional consumption"—which means that consumers have no elemental need for them, and can

MATERIAL HANDLING NEWS

GERMANY *modernizes coal handling*

To speed coal delivery to their modern 313,000 kilowatt electric power plant, public officials in Gersteinwerk, Westfalen, have replaced slow-moving crawler-tractors with a fast Michigan Tractor Shovel. The versatile Michigan does the complete outdoor handling job, moving the coal from truck and rail delivery points to stockpiles and plant conveyors.

Moves 250 tons hourly

Dozing a typical 150 foot distance from dumping area up onto the stockpile, the Michigan regularly achieves a production rate of 250 tons per hour. Output is equally high on conveyor-feeding assignments; here the Michigan's special bucket carries 5 cubic yards per trip.

Compacts without crushing

Effective compaction is achieved by movement of the Michigan around the stockpiles in its normal working cycle. Through good compaction, the plant is able to get more coal into a small area. Good compaction also reduces the danger of spontaneous fire combustion. Machine's big low-pressure tires have another advantage, too . . . they roll over the coal without crushing it into unusable powder.

Increases quarry production

High speed has reached into many other fields of the German economy. With more airports and roads being built, the need for crushed stone has also increased. One important quarry is at Stuttgart, Wurtemberg. Here, Quarry Owner Karl Epple is dynamiting and crushing hundreds of tons of limestone every week. Busiest unit on his project is the rubber-tired Michigan pictured at lower left. With its 26 mph speed, Michigan loads fragmented rock into trucks, builds haul roads, and disposes of rock chunks too big for crushers to handle.

Excavates muck

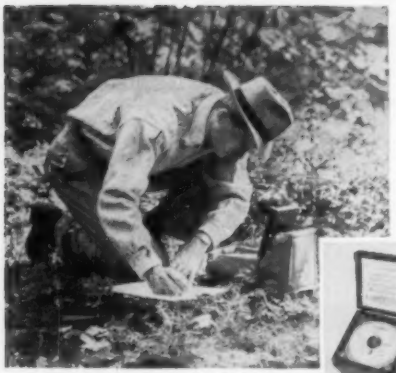
In Schleswig-Holstein, too, Michigan Tractor Shovels are making news. Here, a fleet of Michigans is helping build a water-storage dam. Material to be moved consists of water-soaked muck. Several other machines, tried on the job, bogged down in the soggy footing. A 1¼ yd. Michigan, however, had the balance, power, and four-wheel traction to do the work.

Around the world

Wherever bulk materials are moved, Clark-built Michigan Tractor Shovels, Dozers, Scrapers, Loggers, and Excavator-Cranes are saving time and cutting costs. We will be glad to show you facts and figures on the production *you* could expect from Michigan units. Write for details.

CLARK EQUIPMENT INTERNATIONAL, C.A.
Apartado 2717, Havana, Cuba. Cable: Clarintca, New York. Manufacturing Plants in Australia, Belgium, England, France, Germany and U.S.A.
TRACTOR SHOVELS • DOZERS • LOGGERS
SCRAPERS • EXCAVATOR CRANES

(*advertisement*)

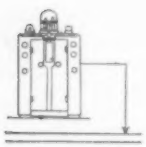


Where Performance Counts

WALLACE & TIERNAN EQUIPMENT IS USED

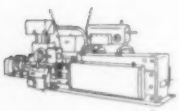
PRESSURE SENSITIVE INSTRUMENTS

The W&T Sensitive Altimeter, shown above, was used on a reconnaissance survey where quick, accurate results were required. The W&T Altimeter was chosen because of its dependability, rugged durability and high order of accuracy. These qualities are typical of all W&T's aneroid and mercurial pressure sensitive instruments, many of which are used in exacting research work and production testing.



CHLORINATION

Equipment includes chlorinators of both the water and mechanical diaphragm types in all capacities, hypochlorinators, and many other auxiliary and accessory items designed for use in the treatment of water for sanitation as well as for numerous industrial purposes.



PROCESS FLOW CONTROL

Equipment includes chemical solution feeders, gravimetric and volumetric dry feeders, and gravimetric meters for use in the chemical, grain, and food processing industries.

AIDS TO NAVIGATION

Includes a number of protective devices for navigation such as buoys, lamp changers, flasher mechanisms, signal timers, fog horns, aircraft flasher units and other related apparatus designed for use in the marine and air transportation field.

Other quality Wallace & Tiernan products and services used throughout the world are listed below. For further information send for list number F-104 of available free technical publications on all Wallace & Tiernan products.

Ammonia Control Apparatus — Cathodic Protection Systems — Chemical Feeders — Chlorinators — Decay Control Process for Produce — Electric Marine Beacons — Flour Processing Chemicals — Pharmaceuticals — Precision Instruments

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REPRESENTED IN MOST COUNTRIES

F-104

take them or leave them alone.

It is the problem of economic abundance—"a problem unique in human history," says Keezer.

Thus marketing has become "an absolutely basic economic process." And in the years immediately ahead, concludes Keezer, "marketing is destined to play an even more decisive role in determining the economic success of the U. S. A."

GASOLINE CARTS—holding two regulation pumping units, an air compressor for servicing tires, and racks for oil cans—are being tested at a shopping center parking lot by American Petrofina Co. Petrofina will also use the carts at regular service stations during rush hours. (*Petroleum Week, Dec.* 26)

POWER OF ADVERTISING was proved by Sweden's Pripp & Lyckholm, makers of a soft drink called "Guldus," by cutting off all advertising for one year. Sales declined 20%.

Then an extensive promotion campaign was launched. The result: sales up 74%.

In addition to regular advertising, the company sponsored horse races and beauty contests; squads of sales girls gave free samples to housewives and to workers in large factories—which opened up an industrial market for the product. (*Euromarket, Jan., p*45)

"THE WHOLE ORIENTATION of this company is shifting toward marketing," an executive of The International Nickel Company of Canada told *Sales Management* magazine. The reason: Production capacity has increased, but competition has also increased, and nickel consumption has dropped.

A new department has been set up with the specific task of "manufacturing" customers in the nickel alloy market. Inco has already launched a series of special advertising campaigns to help sell the end products made from nickel alloys. The company hopes the campaign will create a preference for Inco metal.

Each campaign, usually lasting two weeks, features a particular alloy — stainless steel, structural steel, copper-nickel alloys, etc. Inco's advertising budget is 25% above 1958's.

TOURISTS find Les Halles a colorful sightseeing spot, but it is also a confusing and costly way to merchandise food.

Les Halles: 'Plus ça Change . . .'

Paris's food market is costly to run, but may be even more costly to reform.

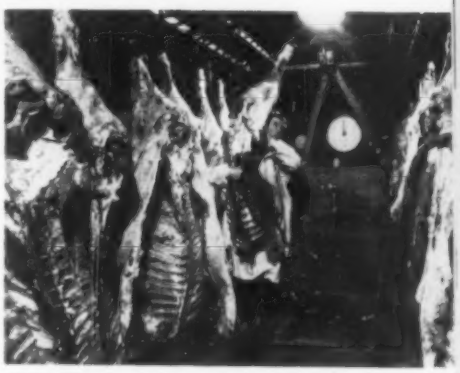
CAN LEADERS of France's new Fifth Republic bring order and efficiency to Paris's colorful but extremely chaotic central market, Les Halles (pictures)? French planners are in agreement that something should be done. But how far they can go is another thing—in view of the high cost of change, and the resistance they would meet from the thousands of food brokers, retailers, and restaurant owners who thrive on this merchandising labyrinth.

• **Marketing Maze**—Located right in the heart of Paris, Les Halles handles most of the food needs of Paris and a large part of France. From midnight on into the next day some 6,000 tons of produce and 6,000 hides of meat change hands. The market is a maze of crates, stalls, and moving *diables* that take produce from trucks into the crowded center.

Economists say that France's high food costs are due largely to the country's archaic distribution system, typified by Les Halles. For example, some 40% of the market's produce comes by rail into Paris, then has to be trucked into the market at twice the rail cost. Meat is slaughtered on the outskirts of the city, but trucked into Les Halles and then back to retailers.

• **Round Trip**—The high cost of this system extends far beyond the city limits. Parisians use only about 40% of the produce that pours into the central market. What is left goes to the provinces. As a result, a lettuce grown in the south may make a round trip to Paris before being sold near where it was grown.

But, despite its inefficiency, Les Halles won't be uprooted overnight. The cost would be prohibitive. Relocating only the meat section to a slaughterhouse area outside Paris —according to a plan now under consideration—would cost 17-billion francs ($34-million). (*Business Week, Jan. 24, p30*)



MEAT is slaughtered on the outskirts, trucked to Les Halles for marketing.

"DIABLES", moving from truck to stalls, tie up traffic, boost price of food.

How 2 cu. yd. Trojan handles all loading operations for Midland, Texas Plant.

Replacing another tractor shovel, this Trojan 154 gives a production boost to the ready-mix plant of West Texas Concrete Products, Inc. The precision control, fast travel speed and high capacity allow it to keep the batcher loaded and still handle truck loading, stockpile maintenance and other chores around the plant.

Trojan 154 digs in, moves material and charges batcher on a fast, continuous cycle.

Your TROJAN distributor can help you with the many advantages of YALE Financing plans, the most complete ever offered to equipment buyers . . . TIME PAYMENTS, LEASING PLANS (with or without OPTION TO PURCHASE) . . . exactly what you need to finance your new TROJAN machines.

TROJAN®
TRACTOR SHOVELS
YALE & TOWNE

TROJAN 154 BETTERS RATED CAPACITY—PROVES "INDISPENSABLE" IN READY-MIX PLANT OPERATION

High capacity and precision control were the features that sold West Texas Concrete Products, Inc. on the Trojan 154. They needed a fast operating machine with the ability to dump exact amounts of material into the batcher. This was no problem for the Trojan 154. . . . But they required a machine with a 2½ cu. yd. capacity. A trial of the 2 cu. yd. model 154 proved that the Trojan could better its rated capacity by ½ yd. load after load, day after day, and still maintain work cycles fast enough to allow it to handle other jobs around the plant area. "The Trojan 154 is a fast loading, fast travelling machine." says Mr. John Marlow, Plant Superintendent of the Midland, Texas Plant. "Its part in boosting the speed of our operation has meant considerable savings for us."

A loading operation for the Trojan tractor shovel involves carrying 6,000 lbs. of rock, 8,000 lbs. of regular sand and one load of fine sand — dumping the correct amounts into the batcher and returning the surplus to the stockpile. The batcher, in turn, dumps the mixture into the ready-mix truck. The fast loading cycles of the Trojan 154 help to complete this entire operation in six minutes.

EXPORT DEPT., TROJAN DIV., THE YALE & TOWNE MANUFACTURING CO., CHRYSLER BLDG., NEW YORK, N. Y., U. S. A.

Technology

British Introduce New Flat Glass

A new type of glass has been developed by Britain's Pilkington Bros., Ltd. that is said to promise a better and cheaper product for automobiles, buildings, store windows, and mirrors. Known as "float glass", the new product is reported to combine the high-quality finish of sheet glass with the freedom from distortion of plate glass. The new Pilkington process feeds a continuous ribbon of molten glass across the surface of molten metal. Float glass, soon to be seen on British automobiles, at first will sell for the same price as plate glass, but the price is expected to go down after Pilkington recovers some of its development costs.

De-Icing System Frees Harbor

Swedish engineers are keeping the channels of Harsfjarde., Naval Station free from ice by piping compressed air beneath the water's surface. The novel system—similar to Britain's air-bubble breakwater (IMD, Sept., p 31)—releases air through submerged perforated tubing. Air bubbles carry the sub-surface warm water upward, breaking up existing ice and stopping any new layer from forming. Designers of the system, Atlas Copco, selected polyethylene rather than iron piping for the job because of its light weight and anti-corrosion properties. (Product Engineering, Jan. 26, p 21)

U.S. Scientists Test Tiny Atomic Plant

Scientists of the U. S. Atomic Energy Commission have produced a two-kilogram device that uses the radioactivity of a man-made isotope for the production of electricity. Known as SNAP III, the device employs thermocouples to capture the heat generated by the radioactive decay of polonium-210. The unit generates 5 watts during the first half-life (140 days) of the isotope, then 3 watts for the second half-life. It is designed for powering instruments on satellites; industrial uses won't be practical until polonium-210 is cheaper. (Chemical Week, Jan. 24, p 63)

Coal Mining by Remote Control

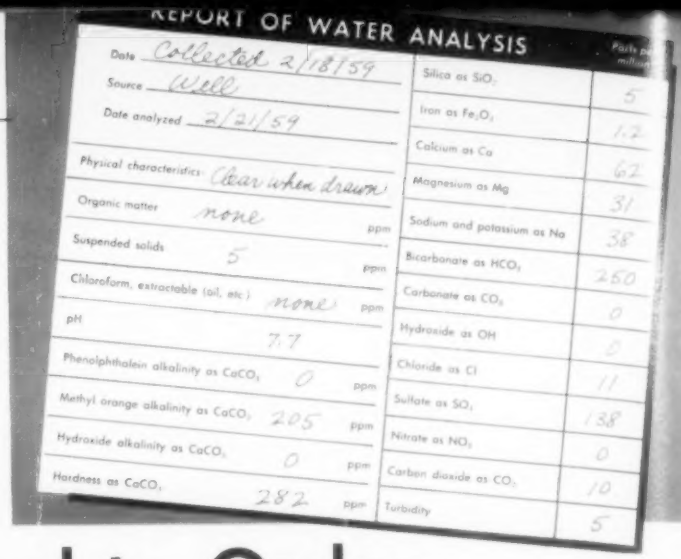
The miner stays above ground in a remote-controlled mining system now being tested by U.S.A.'s Joy Manufacturing Co. The prototype machine uses a pair of sensing stratoscopes for locating the hard layers of good coal. The stratoscopes are connected to an oscilloscope in a control room; blips on the oscilloscope aid the operator in guiding the machine. The equipment automatically loads coal into a transport system that follows the machine into the mine. (Control Engineering, Jan., p 30)

Dam Built with Concrete Spray

A French contractor, Dodin, has built a dam near Cherbourg by spraying concrete through a nozzle against the structure's forms. The dam uses 14 arches of about 8.5 meter span. Their 20-centimeter thickness was built up in two sprayed layers; the first, 15 centimeters, the second, 5 centimeters. Air pressure forced the concrete through a hose to the nozzle, then air from another hose splattered the concrete on the forms. The cement mix—using equal amounts of sand and crushed rock—was shoveled into a conical chamber that could be subjected to compressed air. The machine worked at ground level for the arches' base, then from a footbridge along the top of the dam. (Engineering News-Record, Jan. 22, p 37)

● The swift expansion of industry has placed a strain on water resources in every area of the world.

● But extensive sources of water exist. Engineers today are perfecting filters, clarifiers and ion-exchange units that offer . . .



REPORT OF WATER ANALYSIS

			Parts per million
Date Collected 2/18/59		Silica as SiO_2	5
Source Well		Iron as Fe_2O_3	1.2
Date analyzed 2/21/59		Calcium as Ca	62
Physical characteristics	Clear when drawn	Magnesium as Mg	31
Organic matter	none ppm	Sodium and potassium as Na	38
Suspended solids	5 ppm	Bicarbonate as HCO_3	250
Chloroform, extractable (oil, etc.)	none ppm	Carbonate as CO_3	0
pH	7.7	Hydroxide as OH	0
Phenolphthalein alkalinity as $CaCO_3$	0 ppm	Chloride as Cl	11
Methyl orange alkalinity as $CaCO_3$	205 ppm	Sulfate as SO_4	138
Hydroxide alkalinity as $CaCO_3$	0 ppm	Nitrate as NO_3	0
Hardness as $CaCO_3$	282 ppm	Carbon dioxide as CO_2	10
		Turbidity	5

Water Purified to Order

POPULATION GROWTH and the swift expansion of industry is putting a terrific strain on water resources in many countries. Availability and purity of water is becoming as much a problem in many U. S. industrial areas as in arid parts of Peru or Pakistan. Yet not enough businessmen make a thorough study of water before planning or expanding an industrial operation.

Firstly, business must recognize that all natural water contains impurities and for most industrial uses must be treated. And it goes without saying that re-use of industrial water—an important conservation measure—involves extensive treatment.

Secondly, the kind of water required will depend wholly on its end use. If you are operating a nuclear reactor or making mirrors, the water must be almost chemically pure. For food processing, water must be tasteless, odorless, and free of most organic matter and minerals. If it is for cooling, other water may be economical.

Chemical engineers are today working on a vast array of filters, clarifiers, aerators, and systems of ion exchange that will deliver the precise water industry needs—at an economical price. How far they have advanced is outlined in a special technical report published by *Power* magazine.

• **Four Uses**—Industry uses water for four main purposes: (1) as steam for generating power; (2) for heating and cooling; (3) as a medium for transporting and processing materials, such as paper and chemicals; (4) as an ingredient going into a finished product, as in beverages and canned foods.

What treatment water will require will also depend on the nature of the local supply. Here are the principal impurities found in water:

—Turbidity and sediment: Amounts range from almost zero in ground water to 60,000 ppm (parts per million) in muddy and turbulent rivers. The standard for drinking water is 10 ppm; water for quality paper pulp must have no more than 5 ppm.

—Color: Surface waters get their color from decaying vegetation. Amount of color is compared with a standard. Drinking water should have no more than 20 units. Many processes can stand no more than 5 units.

—Microbiological growths: Water cannot be presumed safe merely because it is clear and odorless. Growths include various kinds of bacteria, slimes, molds, and algae. Some are dangerous to health, others objectionable because they clog up processing equipment.

—Hardness: This comes from the presences of calcium and magnesium salts in the water, which corrode equipment and create stony scales that clog up systems. Temporary hardness is present as bicarbonate salts; permanent hardness as sulfates, chlorides, and nitrates.

—Other impurities: Among the many other troublesome materials found in water are silica, iron, manganese, sodium and potassium salts, carbon dioxide, oxygen, and nitrogen. Silica forms a hard scale in high-pressure boilers. Free carbon dioxide, found in most well waters, is corrosive and accelerates oxygen corrosion.

• **Water Analysis**—A first step in the selection of water treatment equipment is an analysis of the water to be used. Surface waters generally vary greatly in composition during a year. Maximum impurities may range up to 400 times minimum amounts. Water from deep wells usually has a uniform composition.

Analyzing water consists of finding out how much of the various impurities are present in a measured sample. The results are expressed as a proportion by weight, normally in parts per million (ppm). In a typical analysis (illustrated above) hardness shows up as the number of milligrams of calcium carbonate ($CaCO_3$) in a kilogram of water.

Evaporation and ion exchange yield water in its purest form for industrial use. But such comparatively high-cost equipment is not warranted for most water needs. It is more practical to treat water for a specific end result, in accordance with the demands of its use.

• **Clarifiers** — For many plants the main object of treatment will be elimination of gross impurities and hardness. The main tools for these

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No matter where your business is—no matter in what part of the world—you're always a neighbor of Bethlehem Steel or one of its representatives. Bethlehem has a global organization designed to serve the export trade, and our people do everything possible to meet your needs in a prompt, friendly manner.

We want to make it easy for you to purchase steel. And we want to render every service that will be helpful to you. Because of our many convenient locations all over the world, Bethlehem is especially well equipped to cooperate with you, as a good neighbor should. Bethlehem Steel Export Corporation, 25 Broadway, New York 4, U.S.A. Cables: "BETHLEHEM, NEWYORK."

Bethlehem supplies steel to world markets in all forms, including

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PLATES ★ STRUCTURAL SHAPES
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WIRE PRODUCTS ★ RODS ★ RAILS

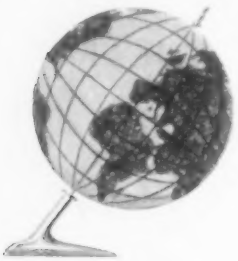
thlehem's great Sparrows Point plant in the Port of Baltimore, U.S.A., is the world's largest steel ill located on tidewater. Products for export can be loaded from this plant directly aboard ship.

★ BETHLEHEM STEEL ★

Represented in all principal cities of the world by offices and representatives of Bethlehem Steel Export Company

7038

Wherever your business ...whatever its size



...Burroughs service is always nearby!

Wherever business is conducted, Burroughs is there to speed the flow of paper work.

And in serving you, Burroughs does more than merely offer a full line of data processing equipment.

If you have a data processing problem, your Burroughs Sales Representative will step in and help you solve it. His experience in advanced accounting methods combined with his knowledge of modern business machines can mean tremendous operating savings for you.

Where your Burroughs Sales Representative's job ends, your Burroughs Service Representative's job *begins.*

He handles the Burroughs equipment installation and makes sure it operates perfectly. During the guaranty period, he services your equipment regularly, without charge. After the guaranty period, this service is yours upon request and at reasonable rates. Or, through a Burroughs Service Agreement, your Burroughs Service Representative will give your equipment timely, expert care at regular intervals.

For your convenience, business machine supplies can be ordered from your Burroughs Service Representative.

Service like this—available throughout the world—is one big reason why so many businesses rely on Burroughs for *all* their data processing requirements. *It pays to standardize on Burroughs.*

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purposes are settling tanks, clarifiers, and filters. Such equipment often is used with chemicals that aid in the coagulation of impurities and precipitate salts that can be physically removed. Lime, soda ash, and caustic soda are the most common chemicals used in the process.

In a typical clarifier raw water and chemicals are mixed by agitator and lifted through an uptake in the center of the tank. Impurities and chemicals form a floc that settles at the bottom of the tank, while clarified water is drawn off from near the top of the tank.

• **Filters** — Many filter designs are available for specialized needs. One of the simplest, frequently used by municipal systems and large industries, is a gravity setup in which large quantities of water continuously flow through beds of sand and gravel. The clarified water is collected at the bottom.

With these systems, a light floc forms a mat over the filter bed. This stops fine particles from passing through. The filters must be periodically cleaned.

Many filter designs compete for the job of purifying water. Where water flow is not too great, pressure filters often serve better than gravity designs.

Leaf and tubular filters use filter aids of diatomaceous earth or other pulverized material. Water passes through a cake formed by the filter aid and impurities. The cake periodically is removed and the internal assembly cleaned.

• **Chemicals**—Of the many water-treatment chemicals used (some of them in short supply in certain countries) lime, soda ash, and caustic soda are the most versatile. These four rid water of its most troublesome impurities, including calcium and magnesium hardness, bicarbonate alkalinity, and silica.

These versatile chemicals form the basis for cold and hot processes. Water treated by cold process is never completely softened, because some salts remain slightly soluble in the treated water and therefore do not settle out. Cold-process treatment may reduce hardness down to 25 to 50 ppm, and bring silica residuals down to 3 ppm.

Water for boilers requires more efficient removal of hardness and silica. This is done by hot processes using live or exhaust steam as a heat source and operating at 100 C or higher.

• **Aerators & Deaerators**—Aeration consists of intimately mingling air and water. It is done with spray nozzles, cascade aerators, pressure aerators and, for low flows, by bubbling air through water in a storage tank. The process is used for removing iron and manganese through oxidation, and for eliminating unwanted taste and odors in municipal supplies.

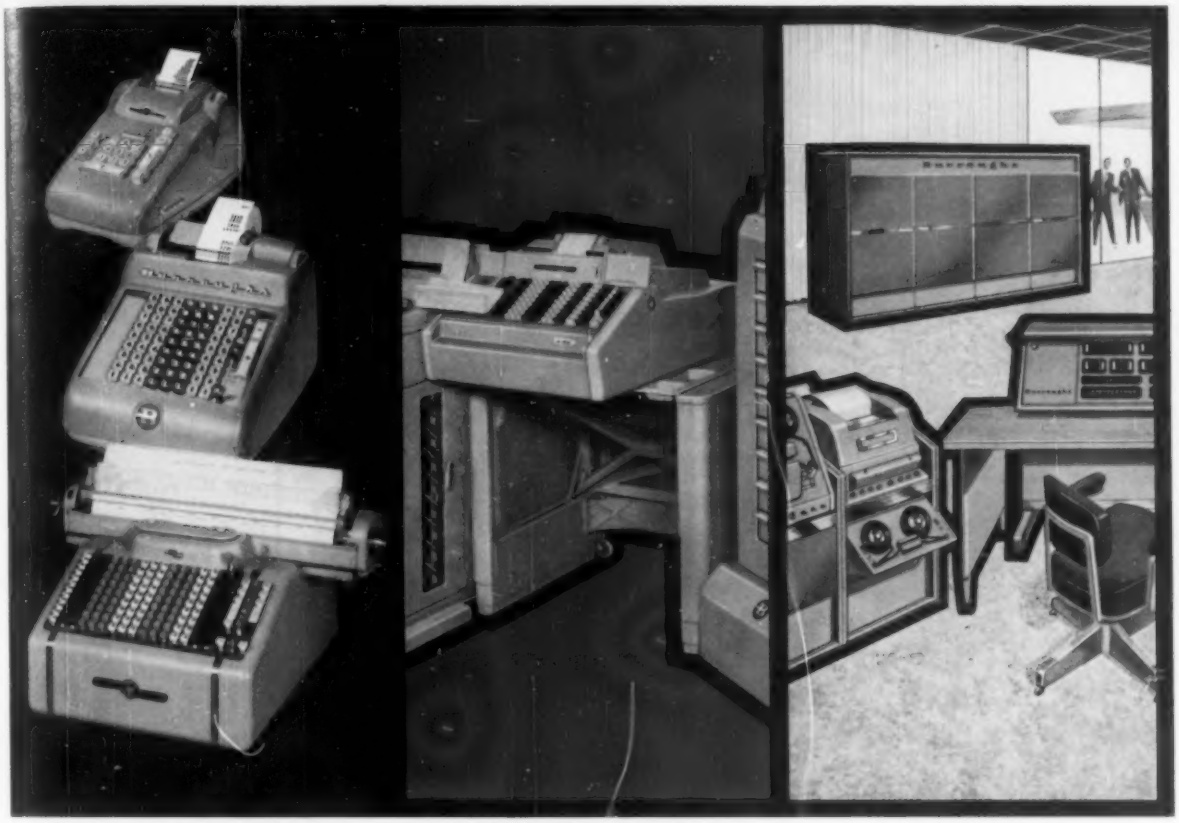
Deaerators force steam through a water supply and cut down dissolved oxygen and carbon dioxide. Oxygen can be reduced below 0.005 cc per liter.

• **Ion Exchange**—Top quality water today often is made by ion exchange equipment. The product can be a water that is as chemically pure as that made by controlled evaporation. The process has been found practical for high-pressure power plants, nuclear power reactors, and certain specialized process waters.

Ion exchange does its purifying job by electrolytic absorption of impurities. Unwanted particles in water disassociate to form ions that are either positively charged (cations) or negatively charged (anions). Special resins used in the exchanger have the power to pick up these cations and anions in exchange for oppositely-charged ions in the resins. The ion-exchange material then gives up the impurities upon being washed by a strong regenerating solution.

In a typical installation for softening, water is passed through a styrene-base resin. The water trades calcium and magnesium cations for sodium cations, continuing this operation until the exchanger runs out of sodium. Softening then stops, and the bed of styrene resin is regenerated to restore its capacity.

Other ion-exchange units selectively remove other dissolved solids from the water. Systems that combine cation and anion resins—either multi-bed or mixed-bed—produce water of the highest quality. (*Power*, Dec. 1958; March 1959. Reprints of *Power's* two-part report can be secured by sending $1.00 to INTERNATIONAL MANAGEMENT DIGEST.)



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Whatever your business...whatever its size... Burroughs builds equipment to meet your every data processing requirement!

The reason Burroughs can meet your every data processing requirement is this: Burroughs produces the widest range of business machines in the world.

In adding machines, Burroughs offers you a choice of 10-key, full-keyboard, and multiple-total models. It's the same with accounting machines . . . you have a choice with Burroughs. To name three: new low-cost, fully automatic P-600 . . . Sensimatic with unlimited programming flexibility . . . Sensitronic for automatic *electronic* accounting.

In electronic computing equipment, too, Burroughs can virtually custom-fit a machine to your job. For everyday business computations it's the new Burroughs F-2000 . . . for more complex, medium-range computing, the new desk-size E101 . . . and for large-scale computing, the new Burroughs 220.

No problem is too small . . . no application is too big for Burroughs data processing equipment. And the beauty of it is . . . a Burroughs machine will pay for itself in savings, over and over again.

Call your Burroughs man

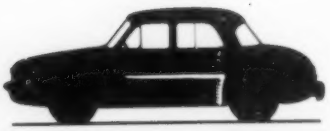
Your Burroughs man is a specialist in modern, cost-cutting accounting methods. For his address, write: International Division, Burroughs Corp., Detroit 32, Mich., U.S.A.

He knows 3 words :

Mummy, Daddy, Car

... already he has a mania for cars.
In a year or so he will treat you to a discourse on mechanics ! And when he plays with his toy models he will be dreaming of driving a

2098



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Communications Lag Behind Science

TECHNICAL ADVANCES pile on top of technical advances, but much of this work is lost to industry due to poor documentation and communication. Research races ahead, but the task of recording, indexing, storing, and retrieving its findings lags far behind. The result is lost effort, inefficiency, and disorder.

These are the somber conclusions reported in *Product Engineering* by U. S. documentation expert Allen Kent, after a seven-week study-trip through most of Europe and the U.S.S.R. He found the world's documentation system in near chaos—and less being done about it in the non-Communist countries than in the U.S.S.R. The Soviet program toward coordination of research and industrial operations is further ahead than that of the U.S.A., Kent reported.

Kent talked to linguists, mathematicians, chemists, and engineers working on document research and translating systems. He noted three significant trends: (1) more centralized processing and distribution of technical abstracts and indexes; (2) work on the development of translating and data-searching machines; and (3) coordinated efforts involving linguistics, logic, mathematics, and engineering—aimed at improving these machines.

Here are some of the encouraging signs reported by Kent:

—**In the Netherlands,** worthwhile progress in developing *microfiche* for storing documents in photographically-reduced form.

—**In Britain,** a hard-working group studying the problem of analyzing recorded data for later search and retrieval. Also, important work on translating machines.

—**In Australia,** a mechanical means for scanning the prior research in some subject classes.

Many of the industrial organizations surveyed by Kent reported that they had to supplement outside abstracting and indexing services with regular literature-processing activities of their own. Professional societies often supplied companies with less than half of the abstracted data they needed for use of their employees in given fields. ●

EXPERIMENTAL VEHICLE rides 10 cm. above ground, gets its lift from air generated by a horizontal propeller and applied through under-chamber.

Machines Scoot over Air

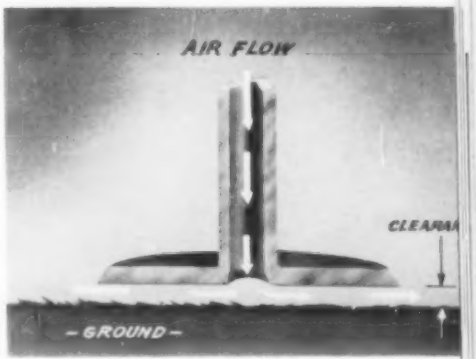
MACHINES WITHOUT WHEELS that some day may float over land and sea at speeds of 150 kilometers per hour and more are being studied in the U.S.A., Britain, and Switzerland. They ride on cushions of air, and their inventors believe that they may eventually take the place of the usual earthbound autos, trucks, ships, and railway wagons.

An experimental model developed by Spacetronics, Inc. (picture above) has been displayed in the U.S.A. It rides about 10 or 12 centimeters above the ground, getting its lift from air pressure of about 70 grams per square centimeter applied in the large cavity that makes up its undercarriage. The researchers see it as a device for traveling over swampy ground, snow, or ice.

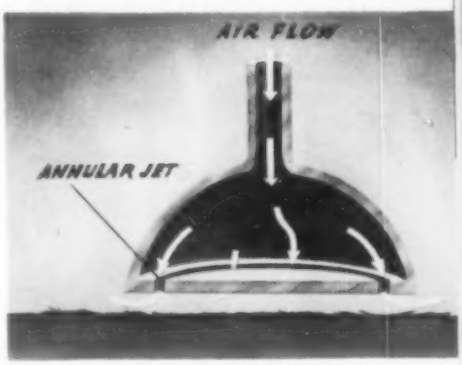
• **Big as a Ship** — Getting research attention in British and Swiss laboratories is a much larger vehicle, perhaps a hundred or more meters in diameter. It would use higher air pressure, operate closer to the ground, and might some day replace ocean liners.

The secret of these machines—including a new scooter shown by Ford Motor Co. last month in Chicago—is the discovery that the lifting capacity of certain machines can be increased several hundred times when they stay near the earth. The principle has been put to work in the variety of experimental lifting devices shown at right.

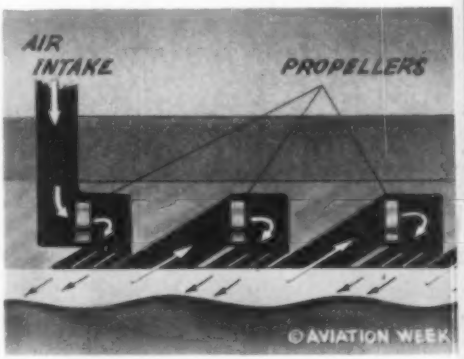
Ford's experimental scooter uses flat circular plates known as "Levapads". Compressed air is forced out of the center of the plate; the air jet lifts the plates only a fraction of a centimeter off the ground. This vehicle, unlike the Spacetronics machine, travels only on smooth surfaces. It may be most suitable for rail transportation. (*Aviation Week, Jan. 12, p 74*)



LEVAPADS, being tested on scooter, force air through the center of plate.



ANNULAR JETS feed air around periphery, give added lifting strength.



LABYRINTH SEAL, for large ship, would maintain a strong air cushion.

Finding the Hidden Handling Costs

The costs of materials handling can not be kept in line—unless they are isolated, recorded, analyzed.

IF YOUR FACTORY is like many in America, it may be missing one of the surest means of saving money. Does it keep detailed cost records of materials-handling operations? And even if it does, do the records reflect a fair share of handling charges often hidden in production activity?

Some 20% to 25% of industry's labor force does nothing but handle material, according to *Factory* magazine. Yet a new "door-to-door" survey of 70 small and large U. S. factories by *Factory's* editors showed that most companies were not keeping separate cost data on handling operations. Only a few recorded handling charges at all—and even fewer attempted to isolate these costs accurately.

Handling adds nothing to the value of a product. It is a distinct activity that should be separated from other indirect labor. Only by doing so can management analyze handling methods and find ways of improving them.

A first step in understanding these costs is to recognize that there are two kinds of materials-handling operations: specialized and mixed.

• **Specialized Handling** — These are clear-cut handling operations, where men and equipment devote all—or an easily identifiable portion—of their time to receiving, shipping, and storing materials. The charges can be readily segregated, and they are subject to simple cost reporting and accounting.

• **Mixed Operations** — Handling that is an inherent part of production—positioning and feeding, intermittent movement of materials —presents a more difficult job for cost accountants. Most managers ignore the handling nature of these tasks—counting them as part of the production work being done. The costs remain hidden, and management has an inaccurate record of both its production and handling costs.

Though no one has come up with a system that can isolate all these fixed costs economically, a few manufacturers have been making headway. One company attacks the problem by handing each of its operators a tally sheet, on which they record time spent in moving materials in and out of work stations. Accountants then can report this time as a per cent of direct labor, as well as treat it as an item of unit cost. This method is particularly helpful where casual inspection suggests that handling costs are unduly high.

Where mixed handling is large and easily identifiable from direct labor, some companies find it worthwhile to relieve operators of these duties. Material movers take over the handling phase of the work, and their time is recorded as specialized handling.

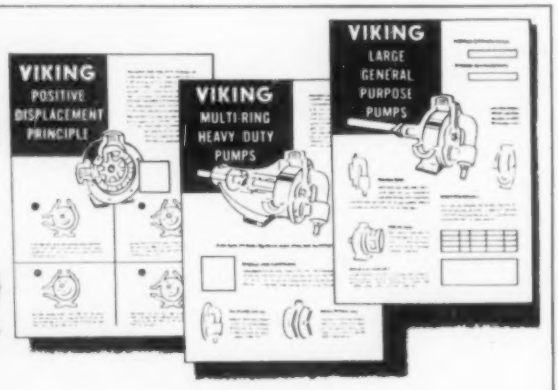
One company uses work sampling to get facts about hidden handling costs. Individual jobs are studied periodically, and a ratio of handling to production time is worked out. The cost of such studies must be weighed against the expected savings.

Below is the record of how three U. S. companies found savings by organizing and recording their handling costs:

• **Watching Cost Trends**—International Harvester Co. keeps its eye on cost trends and ways of improving handling methods by having each of its plants collect cost data on uniform quarterly reports. These reports to headquarters cover only handling labor. Labor is the biggest part of handling costs; it is easy to tabulate, shows cost trends, and offers the best means for cost control and improvement.

Plant reports break down handling costs into various classifications—warehousing of machines, warehousing of parts, inter-station movements, unloading and storing supplies. No effort is made to compare operations at differ-

PUMPS ON YOUR MIND?



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VIKING GENERAL PURPOSE PUMPS — These Viking Pumps — in 2½ to 1050 G.P.M. sizes — are suitable for pressures up to 100 PSI. They are fully illustrated and have specifications, performance data, etc., in the 36-page catalog BX.

All Viking Pumps are positive displacement pumps and deliver either thin or thick liquids.

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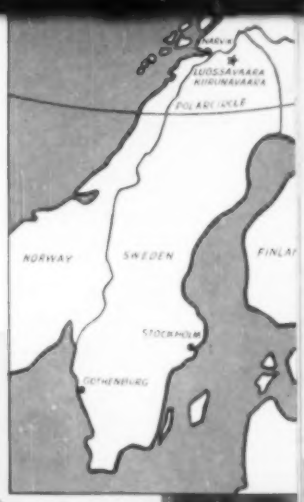
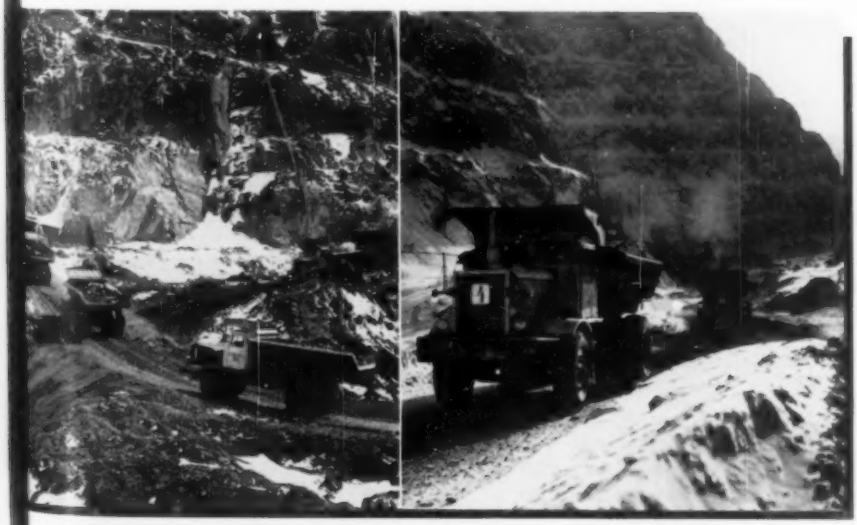
"28 stycken Euclid fraktar 22,000 ton järnmalm per dag..."



That's the report from northern Sweden where a fleet of 28 Euclid Rear-Dumps move 22,000 tons of iron ore every working day of two eight-hour shifts. Located far above the Arctic Circle in Sweden's biggest and richest mining area, the open pit mine of Luossavaara-Kiirunavaara AB at Kiruna will produce an estimated 5 million tons of ore this year.

Since five Euclids of 22-ton capacity were first put to work on this project in 1951, the fleet has been increased to 23 units of this size and 5 Model FFD "Eucs" that have a payload capacity of 34 tons. Company records show that these haulers have moved nearly 43 million tons of ore and have worked more than 400,000 hours in a climate where temperatures vary by over 100° with winter temperatures as low as 30°F. below zero. It takes rugged, dependable equipment to maintain steady production under these conditions.



The first Euclid equipment to be used in Sweden was delivered in 1946. Since that time the 300 "Eucs" now in that country have helped develop natural resources of mines and quarries, and have worked on many road, airport, and hydro-electric power projects. As on hundreds of other tough jobs throughout the world, these Euclids have demonstrated their ability to do more work at lowest cost. The dealer in your area can show you why Euclids give you a better return on your investment . . . just ask him for facts and figures.

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plants (these plants vary greatly) but similar operations at each plant are compared. Such comparisons have shown common cost trends and resulted in handling improvements.

• **Budgetary Control** — A large factory of Thompson Products, Inc., divides its handling operations into three kinds: central trucking, internal (between departments), and production-integrated. No effort is made to isolate costs of production-integrated handling, but the other two kinds are under close budgetary control. Monthly reports show standard and actual expenses for central trucking and internal handling.

Central trucking keeps detailed cost records—expenses for labor, equipment, and supplies — and charges each department for its services at an hourly rate. Production departments supervise internal handling, but each receiving and routing operation is separately charged and accumulated. This has meant cutting down on mixed handling hidden costs.

• **Separate Accounts** — Dallas Tank Co., a 250-employee manufacturer of tanks and refinery equipment, keeps track of all handling costs through three separate accounts: trucking, leased-truck movement, and other materials handling. Foremen report basic cost data to accountants.

Mixed handling is included in direct costs, but all identifiable items find their way into the three accounts. Handling costs include supervision, labor, equipment maintenance, depreciation, insurance, and allocated overhead. ●

MATERIALS are within easy reach of this exterior wall production line.

Open-Air "Factory" for Houses

A U. S. CONTRACTOR, J. A. Jacobson, has applied assembly-line factory methods to house-building, and today is erecting complete house shells in a matter of two to two-and-a-half hours. The method gives him a house at $300 less than conventional methods, and cuts 25% off erecting time.

On-the-site production lines turn out exterior walls, partitions, and gables. The line for exterior walls is 75 meters long, the one for partitions, about 30 meters. Lumber and other materials are stored where they can be efficiently fed into the lines.

The outside panels are complete except for glass and metal corners. Glazing was eliminated when Jacobson found that moving the panels pushed the putty out of place.

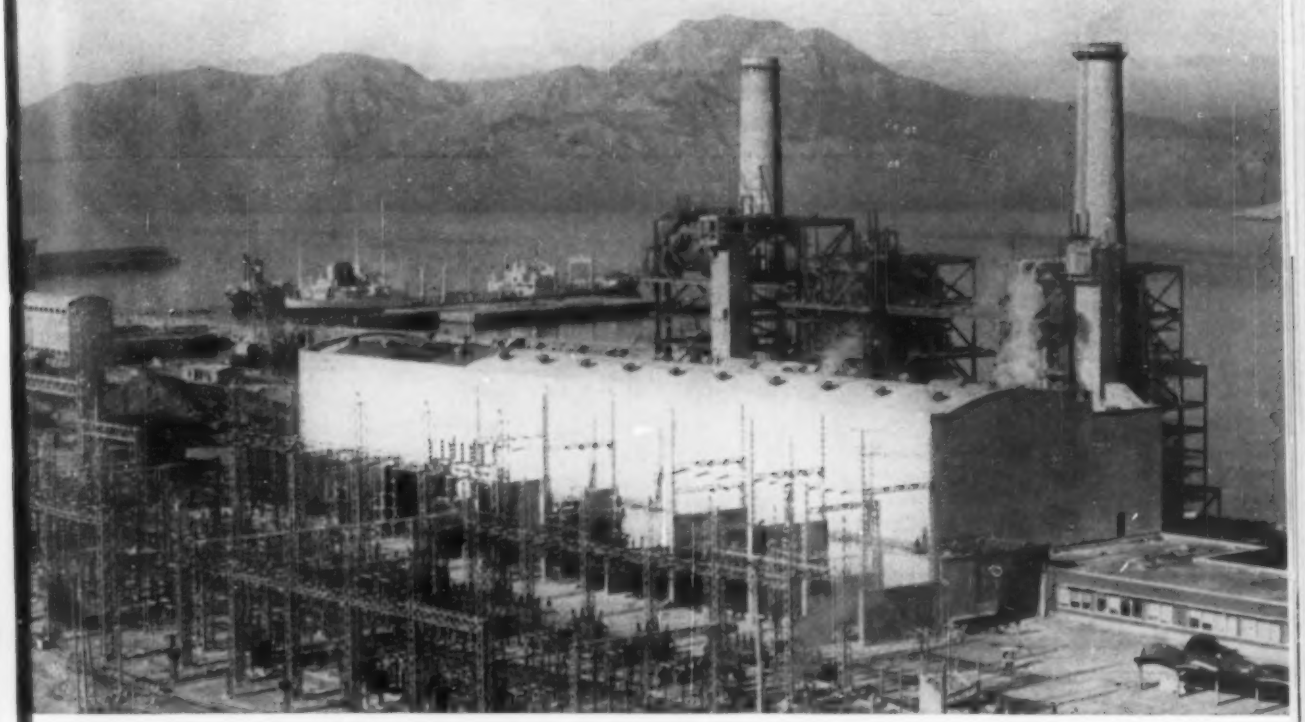
The assembly lines are set on permanent concrete foundations. Jacobson used them to build 440 houses in 1957-58, and expects to build 250 more this year. Panels slide along wood rails as they are assembled, pulled by drag lines.

The completed panels are hauled to the house site on trailers pulled by pickup trucks. A crane places a 17-meter-long panel in position in 10 to 15 minutes.

Only the framing of the partitions is completed on the assembly line. After they are put in place, workmen attach plasterboard to the frames and tape the joints.

When the shell is completed and anchored to the foundation, the plumbing, heating, wiring, hardwood floors, and tile are installed. With this system, Jacobson produces seven houses a week. (*Engineering News-Record, Jan.* 15, *p*48)

A Report On Power For Progress



At Escombreras A General Electric "Power Package" Is The Heart Of The Largest Thermal Power Plant In Spain

Hidroelectrica Espanola, S. A. one of the largest electric utilities in Spain, has had to supply power for both the southeast corner of the country and the Madrid area. The company depended primarily on hydroelectric power, thus droughts often caused restrictions on power supply. For the highly mechanized industries in the area, these power shortages meant production curtailment and higher operating costs.

To avoid future power shortages, Hidroelectrica Espanola, S. A. constructed the new Escombreras Thermal Power Plant using a complete General Electric "Power Package". The total yearly output of this plant — 1,500,000,000 kilowatt hours — will not only provide ample power for present industry and irrigation, but it will also encourage development of new industries in the area.

The heart of the Escombreras plant is its three G-E steam turbine-generators. Two hydrogen-cooled generators rated at 78, 125 KVA and one 160,000 KVA result in more than 280,000 kilowatts at 0.9 power factor. Hidroelectrica Espanola selected the high-efficiency reheat cycle which was developed by General Electric. The long and efficient life engineered into these units is typical of the installation as a whole, for it incorporates most recent design improvements.

In addition to supplying this vital equipment, G-E acted as prime contractor. They were given unit responsibility for all U. S. A. — supplied electrical and mechanical equipment and for engineering design services. G. E. worked with other manufacturers on all phases of the project from preliminary planning and design . . . through manufacture and shipment . . . to installation and start up. This kind of overall planning meant that the system was made up of integrated equipment to provide maximum reliability and economy of operation. All work was closely coordinated with Hidroelectrica Espanola's plans to achieve commercial operation of the 1st unit within 24 months and the 3rd unit within 33 months.

The General Electric equipment in outstanding power plants all over the world reflects G-E's long experience in the electric utility field. For information on how General Electric can assist you, contact your nearest G-E representative or write: *International General Electric Co., Dept. 59-3, 150 East 42nd Street, New York 17, N. Y., U. S. A.*

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YOKOHAMA, JAPAN—Bales of raw silk are sped from warehouse to quay by this Yale petrol truck. From warehouse to quay—from quay to ship—it's the same the world over as Yale trucks expedite goods in world trade. In factories, too, durable Yale petrol trucks save costs, time, space and labour as they move loads ranging from 2000 to 20,000 lbs.

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Trucks Run on All Fuels

MOTOR CARS that burn anything from peanut oil to high-test gasoline may be on their way.

Berliet, the French truck-manufacturer, recently displayed in Paris an engine that runs on gasoline, fuel oil, diesel oil, kerosene, peanut oil or cod-liver oil. The engine owes its versatility to double injection and to piston depressions that act as combustion chambers.

• **Not So Eager**—Across the Atlantic, American designers are not so eager about the commercial possibilities of multi-fuel engines in the U.S.A. (because of design problems, and because plenty of conventional fuel is available). But they are energetically going ahead with development of units for the military—so that available fuel can be used in any combat area.

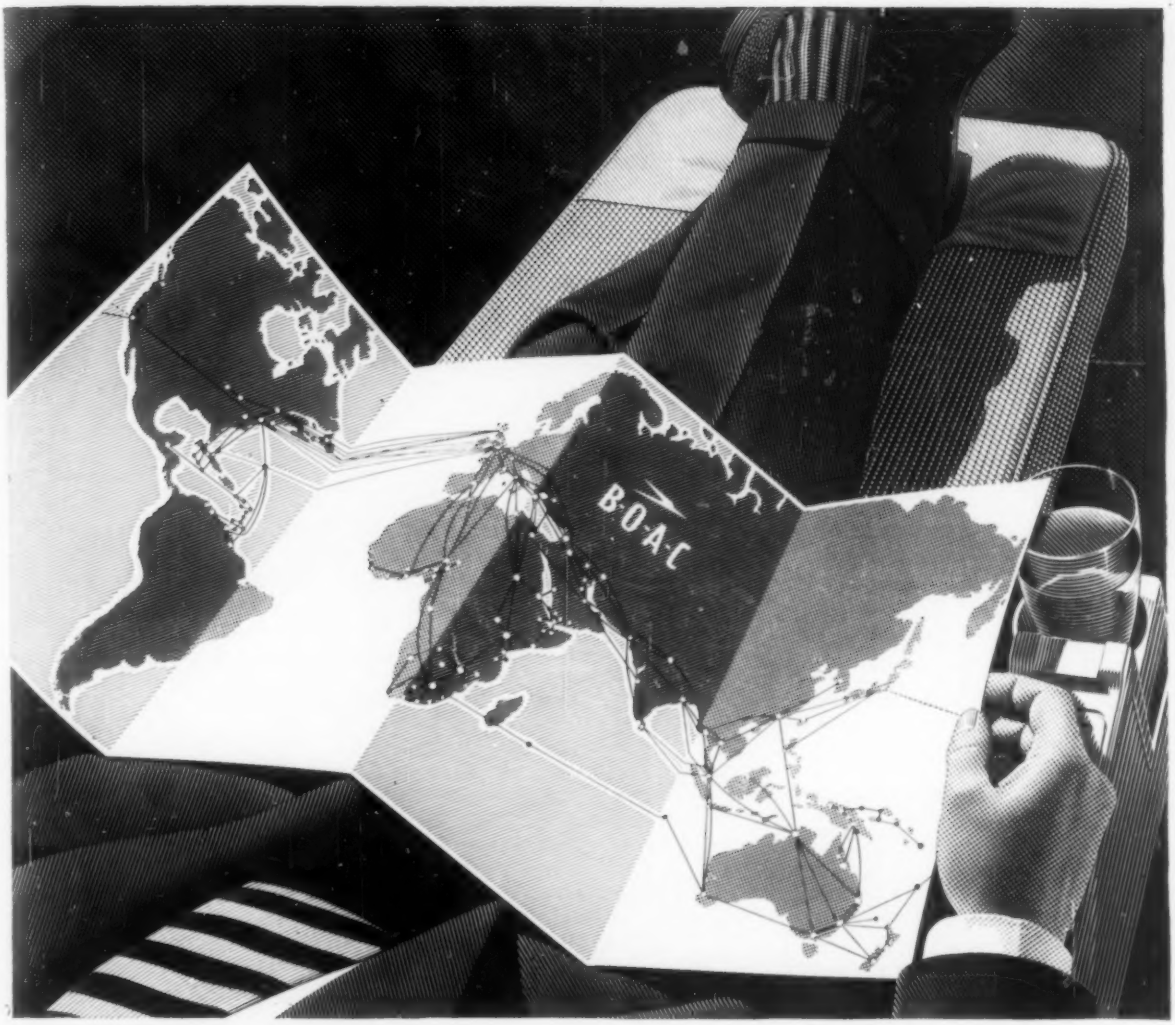
Prototype engines have been tested in U.S. Army trucks, and officials say that they "have already proven themselves practical for future production." (*Petroleum Week, Jan. 2, p20*)

Electronics Aid the Fishermen

FISHERMEN soon may be able to use electronic tools both for locating and bringing in their catch. U. S. government experts recently have been testing a device that pulses an electric current through the water; fish are stunned, then easily picked up by dip nets.

The device immerses two electrodes, one positive and the other negative, into the water to be tested or fished. A pulsating direct-current charge goes from one electrode to the other. As fish enter the electrical field, they tend to swim toward the positive electrode. As they get closer, the current shocks and temporarily immobilizes them.

• **Stunned**—The fish are not hurt by their experience, but remain stunned long enough to be gathered. Equipment consists of a portable generator, electrodes with accompanying cables, and an electronic apparatus for converting the generator output into wave pulses. (*Electronics, Jan. 23, p31*)



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FORD

MOTOR COMPANY LIMITED ENGLAND

Loom Without Shuttles

Steel tapes do the work of shuttles on the Draper Shuttleless Loom, which has been developed because shuttles wear out and need a lot of watching as they operate. The tapes are mounted on a large reel at either side of the loom. Each has a hook at the end for catching the yarn. As they unwind from the reel —200 to 250 times a minute, depending on the type of weave—one tape thrusts the yarn halfway across the material on the loom and the other picks it up and pulls it through. A special metering device supplies just the right amount of yarn. *Draper Corp., Hopedale, Mass., U.S.A.*

High-Capacity Spherical Bearings

An unusually high capacity is claimed for this company's latest line of spherical bearings. They feature maximum diameter and quantity of convex rollers for each bearing size; centrifugally cast bronze retainers; and high, heavy inner race shoulders. The bearings are suited for tough work on, for example, vibrating screens, crushers, construction and oil field equipment. *Link-Belt Co., Prudential Plaza, Chicago 1, Ill., U.S.A.*

Spark Machine Tool For Intricate Cutting

Another example of Japan's drive to increase exports of precision capital goods, the spark machine shown below represents the newest method of shaping metals to fine tolerances. Here, cutting or drilling is done with tools that erode metal electrically rather than chemically or mechanically. It is not a speedy process (of the two Japanese models, one removes only about .45 kg. an hour, the other roughly 3 kg.) but it reportedly achieves a fine finish, and the machine needs little attention from operators. *Ikegai Iron Works, Ltd., 2 Shikokucho, Mita, Shiba, Minato-Ku, Tokyo, Japan.*

Nylon Screws

Tiny molded nylon screws size #2 and #3 should help solve miniaturization problems in the electronics industry. Apart from its stability, nylon is very tough; precise mechanical dimensions will resist continual resetting of the screws. *Gries Reproducer Corp., 125 Beechwood Ave., New Rochelle, N. Y., U.S.A.*

Facts and Figures at a Glance

Data can be set up and changed in minutes on this Execu-flex chart. There are materials for straight or curved charts, for changing and updating trends, bar charts for comparative figures on any subject and organization charts. *Chart Makers, Inc., 480 Lexington Ave., New York 17, N. Y., U.S.A.*

Electronics "Eye"

The Ultrascope, an electron tube, acts as the eye of a new microscope attachment which for the first time allows direct visual focussing of an ultraviolet image. It converts the invisible image into a picture that can be easily interpreted. The tube replaces the regular eyepiece of a microscope adapted for u.v. viewing. *Radio Corp. of America, 30 Rockefeller Plaza, New York 20, N. Y., U.S.A.*

Traveling Cabin

Easy assembly, sturdy construction, and mobility make this cabin suitable for use as a field office, workshop, or small warehouse. Its 15 parts—including a steel frame and plywood floor—can be erected in only a few hours. Height at the eaves is about 2.4 x 3.3 meters, base measurements 2.19 x 3 meters. There are two highspeed tires and wheel assemblies which, when inflated, provide a total loading capacity of 340 kg. above the net weight of the cabin. *Wheaton National Sales, Wheaton, Ill., U.S.A.*

Collapsible Work Table

When fully extended, a new hydraulic lift forms a table one meter high. It collapses into a neat 22.5-cm. package that can be drawn along with a tug bar. The unit is rated at one-ton lifting capacity, uses a ½-hp motor. Standard platform size is 1.5 meters by 70 cm. *Salisbury Precision Eng., Ltd., Castle Rd., Salisbury, Wilts., England.*

In brief:

Portable Contoura-Matic **photocopier** weighing 5½ kg. comes from *F. G. Ludwig, Inc., Old Saybrook, Conn., U.S.A.* . . . Quick figuring is possible with a tiny, 226-gram **calculator** manufactured by *Contina AG., Vaduz, Lietchtenstein.* . . . Two new **diesel engines**—70 and 80 hp—for trucks, tractors, etc. come from *Cummins Engine Co., Inc., Columbus, Ind., U.S.A.* . . . Nylon does heavy duty as the striking face of a new **hammer.** It comes with a spare pair of screw-in faces, from *Thor Hammer Co., Highlands Rd., Shirley, Birmingham, England.*

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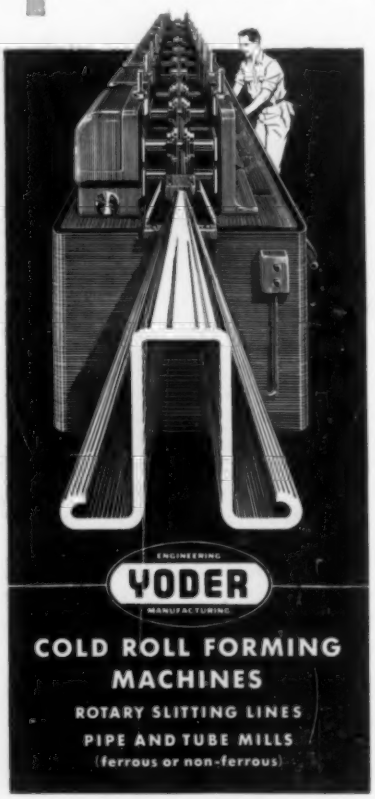

Financial Digest

Workers' pension funds have become a tremendously powerful institution in the U.S.A. And few businessmen realize how revolutionary their influence could be.

According to a special report in Business Week magazine, it is only in recent years that most pension funds have been "funded," rather than treated as payroll expenses or reserves. And almost overnight, assets of these funds have grown to a staggering $33,000-million. By 1965, they will probably reach $77,000-million.

Most important is the $19,000-million or more held by pension trusts, administered by banks, boards, and others.

This money goes directly into investments. The rest is in annuity plans, and enters the money market through insurance companies. (Some funds are a combination.)

The important point is that pension trusts in the U.S.A. are not restricted to investments in government bonds. They now buy more corporate stock shares than any other institution, including commercial mutual investment funds. And they are exploring mortgages, real estate, oil leases.

Economists are investigating the influence of these funds on the capital market, saving habits, economic stability. Lawyers are concerned with new problems of "institutionalized" private property. Political and social scientists ponder the implications of a new leisure class of retired workers.

Management ponders new problems too. In most cases, the company pays the bill—which often accounts for up to 10% of its entire labor cost. With a tax-exempt fund, the contributions are irrevocable. And there are the complicated mortality tables and other details to master.

There is no question either, that a controlling share of some companies resides in the employees' pension trust. Many trusts, too, own stock in competitive companies. That is why you hear talk of an entirely new class of non-voting stock for pension funds.

These pension plans could also change the whole trend of retirement—push the age back, rather than forward.

The hottest debate today centers on "vesting" clauses—which permit an employee to take part or all of his pension share when he changes companies. Many managers oppose vesting, on the grounds that it provides "an incentive to leave rather than stay."

Some economists support vesting for that very reason. Without it, one observes, pension funds could transfer the American economy into a "new feudalism," with little or no worker mobility. And trade unions support vesting because they consider pensions as "deferred wages," and not a gift from management.

Last month's move on the part of a U. S. senator to double the price of domestically-mined gold is given almost no chance of success. U. S. money managers fear the psychological reaction—mostly inflationary—of even easing the squeeze on small U. S. gold mines—to say nothing of the reaction overseas. Speculative interest in gold continues, however. The Toronto Stock Exchange recently announced it would start trading in gold bullion—for the benefit of quite a few Americans as well as Canadians.

Shining example of "extra" chain quality

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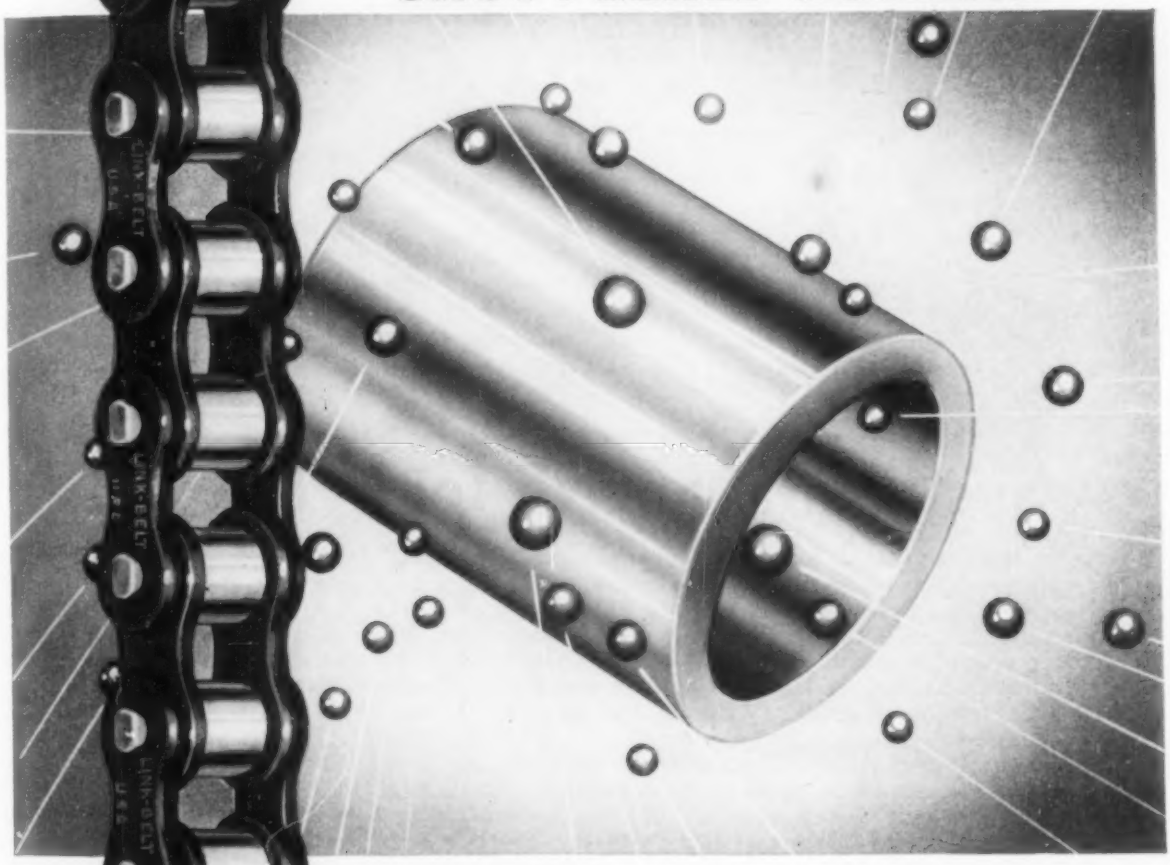

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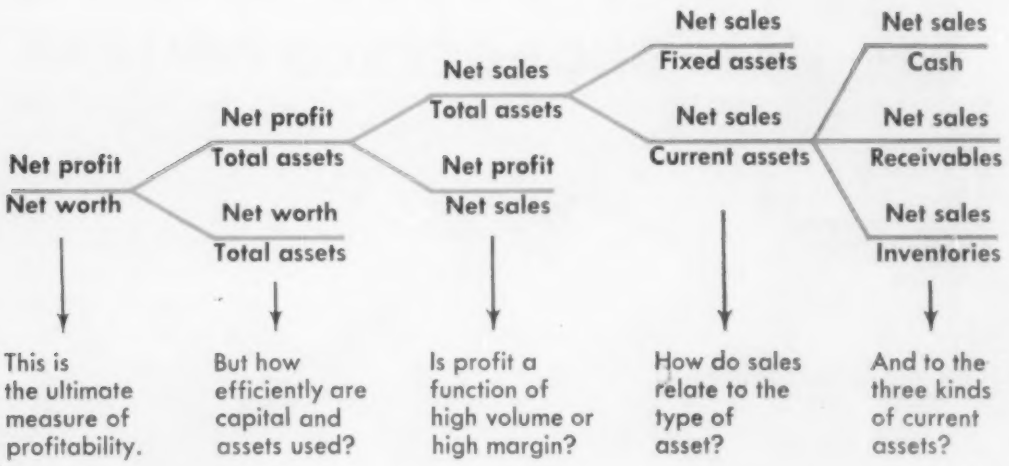
Ratios Show Where the Profits Came From . . .



A Systematic Search for Weakness

STEP BY STEP, the analysis above puts a company's operations into perspective. But more than that, it provides a basis for making valuable comparisons with competitive companies, and for identifying a company's own strengths —and weaknesses.

American managers place great emphasis on evaluating their competitive positions, and they spend long hours comparing financial data, market shares, operating ratios. One of the primary functions of some industrial associations, for instance, is to collect comparative data.

• **Secrecy**—But elsewhere in the world, competitive comparisons have been difficult, if not impossible, to make. Proprietors and managers hesitate to make financial and operating data available. But now there is a widespread effort to encourage disclosure—if not publicly, at least to private industrial associations, or university research centers, with company names suitably disguised for competitive reasons.

Advocates cite the experience of U.S. companies—that much more is gained than lost by the disclosure of such information.

The charts on these pages demonstrate one of the important gains for management: providing a basis for systematic search for competitive strengths and weaknesses. The ratios on the right are for 10 U.S. machine-tool manufacturers. They were calculated by the financial vice president of one of the companies to illustrate what he calls "searching for the existence and broad definition of corporate weaknesses." His analysis was presented at a recent meeting of the methods-conscious Machinery & Allied Products Institute (IMD, Nov. 1958).

Problem areas isolated by this kind of analysis might be day-to-day operating matters such as cost reduction, production planning, inventory control, sales promotion. Or they might be policy problems calling for the attention of the Board of Directors—capital structure, dividend policy, long-range plans for expansion.

• **Broad Comparison** — Such an analysis need not be done with bookkeeping precision. The data published in the annual statements of publicly-owned corporations is adequate. Accounting practices differ, of course—especially in the evaluation of fixed assets and inventory—but these distortions are usually not serious enough to invalidate broad comparisons.

But in making comparisons, be sure to select competitors that are suitable for comparison. Size is an obvious factor.

How Company Size Affects the Ratios

Total assets (000 omitted)	Net profit / Net sales	Net profit / Net worth
Under $250	1.5%	7.8%
$250–$1,000	1.8	7.4
$1,000–$5,000	2.7	8.2
$5,000–$10,000	3.6	8.9
$10,000–$50,000	4.3	9.7
$50,000–$100,000	4.7	10.7
$100,000–$250,000	4.5	10.5
$250,000–$1,000,000	5.5	11.4
Over $1,000,000	8.7	14.1
All companies	4.8	11.1

PROFIT EFFICIENCY improves with size, as these 1957 figures for all of U.S. industry show.

Data published by the U.S. government's Securities & Exchange Commission show that profit margins increase substantially with the size of the company (see chart, left). These figures can also be used to compare a particular industry with the average of all U.S. industry.

• **Critical Ratio** — The ultimate measure of a company's profitability is the ratio of net profit/net worth—i. e., the return on investment. And an enlightening comparison can come from the relationship of this ratio to the ratios of comparable competitors.

In the charts below, 10 comparable U.S. machine tool manufacturers are ranked on the basis of their average net profit/net worth ratio for five years (1953 to 1957). The ratios and rankings for three of the five years show some wide fluctuations in company performance. Company C's position, for instance, has deteriorated markedly.

It can be easily seen that Company C's ranking in 1953 was "1"—the best of all 10 companies. Within two years the company had deteriorated to "9"—and in 1957 it was on the bottom of the pile. Even a bare comparison of Company C's five-year average ranking—"3"—and its ranking for 1957—"10"—indicates deteriorating position.

What causes such changes in competitive position? This is the object of calculating ratios for the nine other factors. The successive breakdown of the factors should provide insight into how the changes came about.

In a complete analysis, all nine ratios for each company—for each year in the study—would be calculated. The general range of the ratios is shown by the summary of high, low, and average figures for one year. A below-average ratio would be a clear warning for a company to make a careful analysis of its operations.

• **Interpretation** — Start the search for weakness by following the "flow" chart at the top of the preceding page. Suppose the return on net worth—the ratio of net profit to total assets—has been declining. Have profits been declining? Or have profits been steady, with net worth increasing?

Both could be rising, but net worth rising faster—thus shrinking the return on investment. If so, perhaps too large a proportion of earnings is being retained in the business.

Are there sound plans for reinvesting retained earnings?

While the first ratio measures the ultimate payoff, it does not tell how effectively capital is being used. This is where the second set of ratios come in. Ownership of the assets is immaterial: The intelligent use of borrowed capital can substantially raise the return on equity capital. And if interest charges have a significant influence on profits, they should be separated in calculating the ratio of net profit to total assets.

As with net worth, total assets could be declining at a lower rate than earnings; total assets could be expanding, with earnings holding steady, or total assets could be expanding faster than earnings.

The ratio of net worth to total assets gives a measure of the use of borrowed capital. How does the proportion of equity capital compare with other companies? Could more debt capital be used without too much risk? Can the proportion of debt and equity capital be shifted?

• **Assets**—The purpose of the third set of ratios is to determine the cause of a deteriorating return on total assets. A good net return may be a function of a high volume of sales, a high profit margin, or a combination of both. A company may have a shrinking volume

How the Ratios Measure Performance

	1957		
	High	Low	Average
Net profit/Net worth	18.5%	1.1%	9.4%
New profit/Total assets	10.9%	.7%	7.0%
Net worth/Total assets	92.7%	59.2%	74.5%
Net sales/Total assets	1.68	1.07	1.32
Net profits/Net sales	8.1%	.6%	5.2%
*Net sales/Fixed assets	8.46	2.36	5.10
*Net sales/Current assets	2.31	1.59	2.00
*Net sales/Cash	21.72	9.64	13.52
*Net sales/Receivables	12.05	5.72	7.95
*Net sales/Inventories	4.53	2.44	3.62

* based on sales turnover per annum, not percentage of figures.

RANGE OF RATIOS for 10 machine-tool companies gives a good guide for comparison with competitors. A below-average ratio would be a signal for closer investigation. Ratios should be calculated over a period of years.

Company	1953-57 Rank	1953-57 Ratio	1957 Rank	1957 Ratio	1955 Rank	1955 Ratio	1953 Rank	1953 Ratio
A	1	16.3%	1	18.5%	2	8.2%	2	23.1%
B	2	14.2	2	13.7	1	12.5	5	18.4
C	3	13.4	10	1.1	9	—5.4	1	33.5
D	4	12.6	4	10.3	5	6.6	4	19.6
E	5	12.4	5	10.3	6	5.8	6	16.0
F	6	11.8	7	8.3	3	7.6	9	11.8
G	7	11.5	3	10.6	7	— .4	3	21.9
H	8	7.9	6	9.4	4	6.7	10	8.8
I	9	6.5	8	6.4	8	—2.2	7	16.0
J	10	5.1	9	5.6	10	—5.6	8	12.4
Average		11.2		9.4		3.4		18.2

COMPETITIVE CHANGES are shown by these rankings of net profit/net worth for 10 companies. Note Company C. Its "3" ranking for the five-year average is much better than its ranking for the last two years — indicating a sharply deteriorated position.

in relation to total assets; steady sales, but expanding assets; assets expanding faster than sales. How does the sales pattern compare with similar companies?

If profits are not satisfactory on net sales, perhaps products are priced too closely. Are prices competitive? How about manufacturing costs—are they getting out of hand? Is shop efficiency declining? Are selling expenses increasing?

The next step is to break down total assets into fixed and current components. If fixed assets seem to be out of line, perhaps sales have declined, with fixed assets remaining the same; perhaps fixed assets have been expanding more rapidly than sales.

Have the "economics of acquisition" been carefully studied? Has the company been overtooling, with cost reductions not enough to justify the investment? Perhaps it would be better to add an extra work shift, rather than more fixed assets.

Fixed assets might be just temporarily out of balance—perhaps a new product is not yet fully launched.

• **Current Problems**—If current assets are out of line, it could be a problem of cash, receivables, or inventories. This brings the analysis to the final set of ratios.

If cash is excessive, are there plans to invest the retained earnings?

Receivables might be in trouble because of credit and collection policies. Have credit terms been recently changed? Are there a lot of new customers with weak credit ratings? Perhaps there have been subtle but far-reaching changes in the marketing pattern of the industry.

Slow inventory turnover can have many implications. Perhaps sales have declined but inventories remained high, or sales been steady, with increasing inventory. Will larger inventory make for better delivery, and higher sales?

Is production planning sensitive enough to sales?

Perhaps the production department is running larger lots to achieve lower manufacturing costs. Will the savings offset the cost of carrying larger inventory? ●

The Good Consultant Leaves A Trail of Satisfied Clients

Businessmen are being warned of charlatans, IMD reported last month. But once warned, there is little excuse for becoming a victim.

"ABOUT THREE OUT OF FOUR management-consulting assignments result from the direct recommendation of a satisfied client—one who has used the services of a firm not once but repeatedly."

This statement is from the U.S.A.'s Association of Consulting Management Engineers, and it probably holds true only for the work done in the U.S.A. by the highly reputable members of this organization. But it also represents the best advice available on how to find a good consultant.

• **Problem**—The consultant has become a problem, particularly in Europe, but also elsewhere (IMD, Feb. p 16). Most complaints come from businessmen who have fallen victim to high-pressure techniques used by some consulting firms. They send out blatant direct-mail appeals, offering a "trouble-shooting" survey for a small fee—$100 to $250. Then the survey man finds trouble, or says he does: "There is one area in your plant where costs can be reduced by $7,000." But he neglects to say where, and he intimates that many such areas exist.

Thus the unwary manager is persuaded to sign a binding contract at so much per hour for an unknown specialist to come in and correct the trouble.

There is no code that forbids consultants from hiring salesmen, sending out literature, advertising, or operating through binding contracts. But good consulting firms are universally "gentlemanly"—they cherish their reputations for probity, trust, and confidence. Once warned, there is little excuse for a businessman being fooled by an unscrupulous consultant.

• **Promises**—The unethical consultant can usually be identified by two traits. He lacks legitimate references; he makes wild promises of results. Before hiring a consultant, check his references. Check with chambers of commerce, trade associations, banks, and business associates. Better still, insist on a "direct recommendation of a satisfied client."

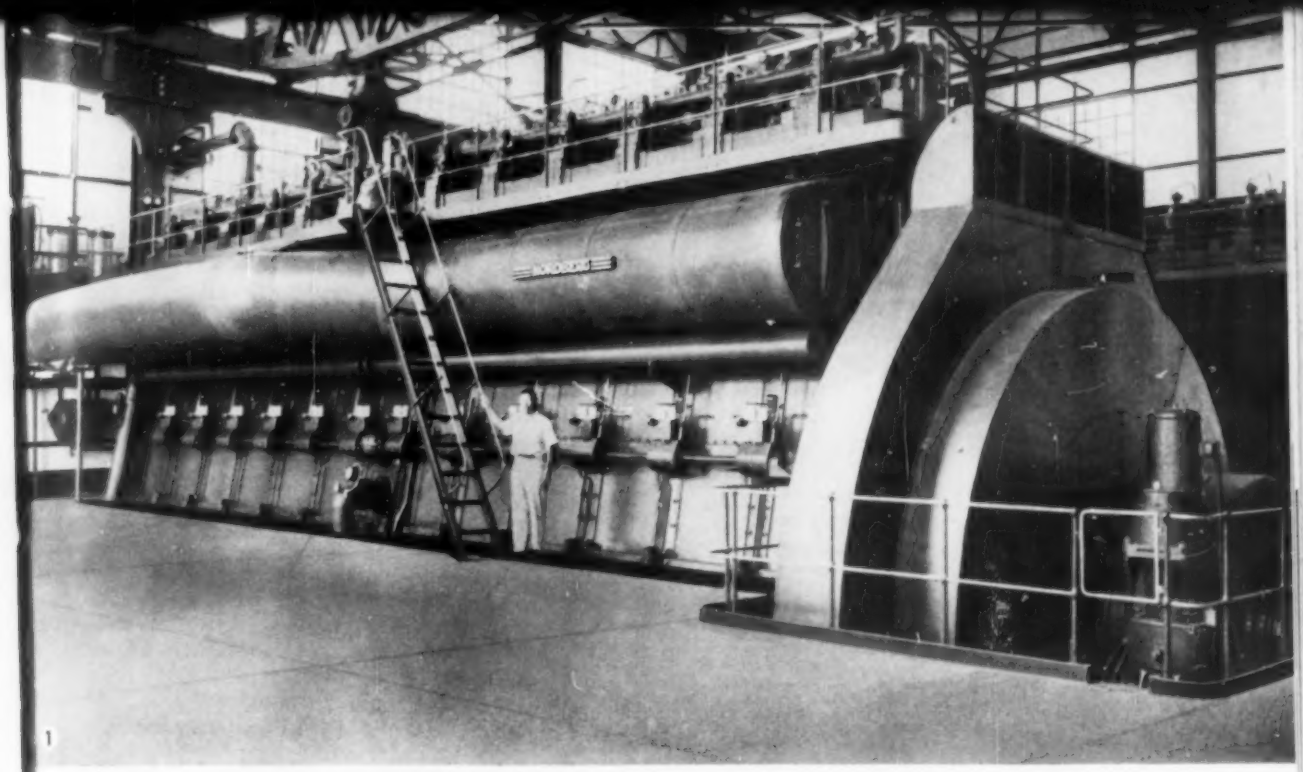
The second-rate consultant—honest but with limited ability—usually can be identified through inquiries too. Sometimes it is a question of inexperience. Even the best consultants were once new at their trade, of course. The real danger is that a relatively inexperienced—or second-rate—consultant will become over-ambitious, and take on jobs he is not trained to do. For the company, it is basically a problem of magnitude. A second-rater might do a good job—on small specific assignments—but you would not want him studying the overall policies and economics of a marginal plant.

• **Consulting Firms**—More and more consulting work is being done by firms—usually a partnership of senior consultants with a staff of specialists.

These firms have passed beyond the "how-to-do-it" consulting that most individual consultants do. They concentrate on the overall problems of the company: organization, planning, marketing, industrial economics. "The company might not need a new system—it might need a vice president in charge of production," summed up one consultant.

Responsible consultants like to stress one point: They consult with their clients; they do not sell "packaged" advice. No consultant can do a good job when there is resistance, when middle management does not understand why he has been hired or the scope of his activities.

• **Experience**—In the last analysis, the problem of the consultant is often one of preparation, not selection. If you know what you want done, the man to do it can usually be found. "What you get out of a consulting firm is in proportion to what you put into it," commented a company president who had suc-



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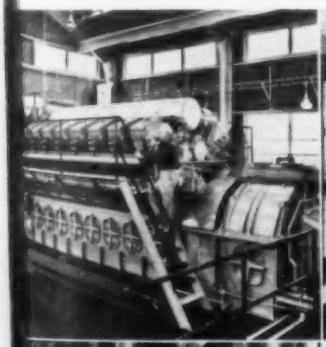

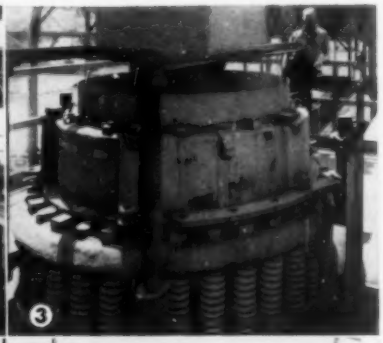

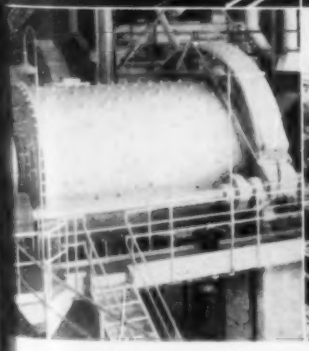

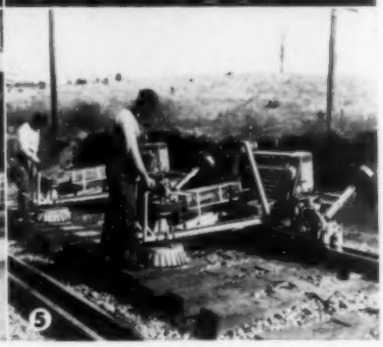

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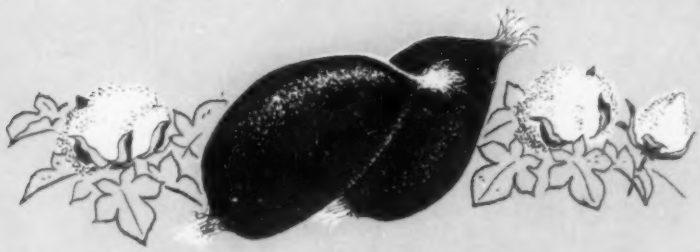

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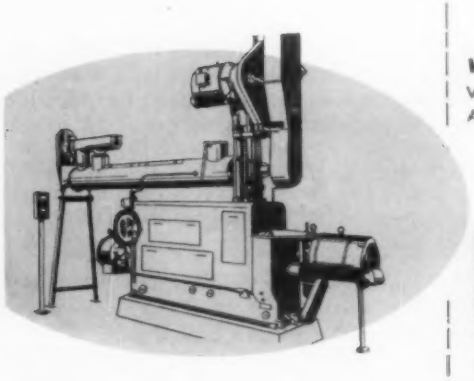

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cessfully used management consultants. His company, The American Welding & Mfg. Co., had a growing business, and as President William Sampson expressed his problems, functions began to get out of balance, lines of authority tangled, and jobs that were done by one man suddenly warranted a new department.

The company had used consultants on a number of occasions—to help solve specific problems. Sampson now realizes the company got only limited benefit, but he offers no criticism of the consultants' work: "They did the job they were called in to do," he writes in *American Business* (Jan., p22).

Unfortunately, difficulties usually turned out to be in some other area. Production control troubles, for instance, were traced to the sales department. "We should have known," admits Sampson, "that all problems in any organization are interrelated." He finally decided to hire a consulting firm to make a study of the company's operations as a whole.

• **Scope of Study**—But what precisely would be the scope of the study? Sampson appointed a committee to study the question, and a subcommittee to draw up specific proposals. The decision was to begin the assignment with a study of customer-order problems — where difficulties were acute—and then broaden into other fields, including:

—Structure of the top-management organization, corporate objectives, financial requirements.

—Research, product development and diversification, future markets, and expansion problems.

—General accounting, factory accounting, and budget controls.

—An organization and procedures manual.

Only then were consulting firms approached for discussions. And before the senior consultant arrived, each department held a meeting at which the program was explained.

"The recommendations resulting from the study (it actually lasted for 15 months)," writes Sampson, "were not laid down by the consultants for us to follow or not . . . They were worked out by mutual agreement." And an unexpected result was the education of middle management during the study.●

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Outside the building it is flush with the wall . . . inside, it extends only 4½" into room. Yet the Imperial is available in ½-, ¾-, and 1-hp. models and so can cool sizable rooms.

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HUDDLED AROUND a new carpet sweeper (above), four members of a Milwaukee, U. S. A., organization called "Executive Committee"—all chief executives in their own companies—exchange ideas and solutions to a problem. Along with four other presidents, they take turns being host to the group.

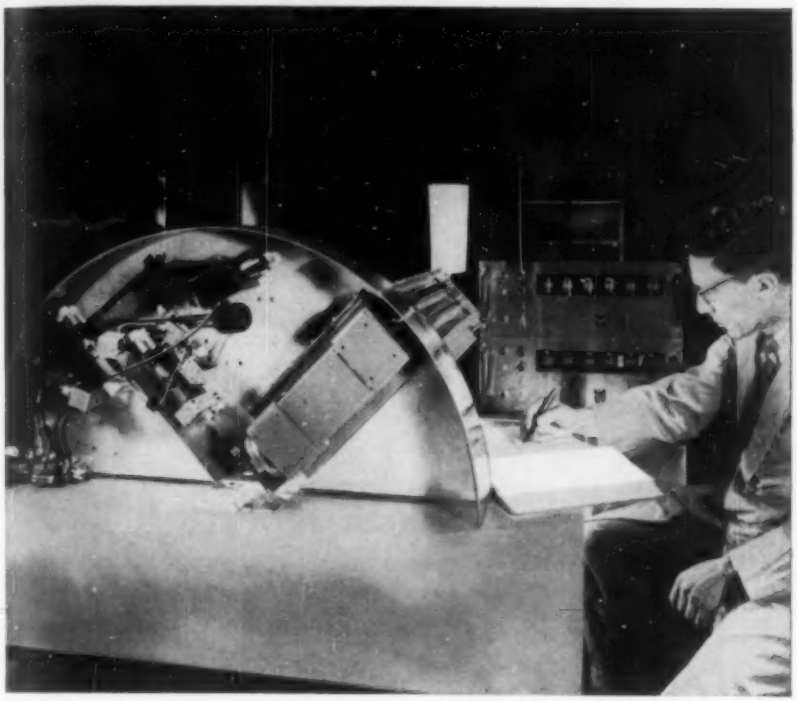
• **Profit Maker**—Executive Committee is actually a commercial enterprise conceived by Robert Nourse, a former small-company executive. He sits as permanent chairman, and between meetings—every six weeks or so—visits the members individually. Nourse collects $175 per meeting from each member for his services.

The main attraction, according to Nourse, is that "each member has more ability and knowledge in some fields. He accepts responsibility for sharing his ability."

• **Family Enterprise**—The companies represented are about the same size (annual sales of $1-million to $5-million); except for one, they are all family-controlled. Favorite discussion topics are problems such as corporate stock control, estate planning, the problem of management succession. There is also considerable interest in management and sales techniques.

Manufacturing problems and products vary widely—printing, hardware, valves, underwear, metal castings, adhesives, ice, and coal distribution. But plant tours are still a popular activity of the group. As one president commented: "We always learn something new—maybe it is just in materials handling — just from seeing how the other fellow does it." (*Business Week, Dec.* 27, *p*86)

Careful processing, typified by X-ray measurement of samples taken from the electrolytic tinning lines at regular intervals, accounts for the consistently high quality of USS Tin Plate.



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Meet "Joe Fringe"

"JOE FRINGE" (shown above) is goodnatured but somewhat overweight, in the opinion of the U.S.A.'s Timken Roller Bearing Co. The cartoon character was created to illustrate the present status of fringe and extra benefits paid to employees. Joe's weight is of serious concern to management.

Fringe benefits are charged to departmental expense centers as labor expense. Current charges are running 83.8 cents per hour worked—25% of total wages—according to the Machinery & Allied Products Institute. They break down like this:

Pensions	16.08¢
Vacations	14.69
Paid Holidays	8.08
Overtime Premium	3.66
Cost of Living Adjustment	16.00
Life & Health Insurance	5.71
Supplemental Unemployment Benefits	5.00
Social Security	3.88
Shift Differential	4.76
Workmen's Compensation	1.57
State & Federal Unemployment Insurance	.98
Holiday Premium Pay	2.50
Sunday Premium Pay	.59
Suggestion Awards	.14
Jury Duty	.07
Military Reserve Pay	.09
	83.80¢

With this detailed breakdown—and with the help of "Joe Fringe"—Timken is trying to get its point across to its employees and the general public. ●

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The Philips Gas Liquefier is simpler, smaller (95 x 50 x 88 cm; 37" x 20" x 35") and several times lighter (250 kg; 5.1 cwt.) than any other machine in use; the unit is completely safeguarded against internal failure of the cycle and no supervision whatsoever is required.

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The considered opinion of one of the many satisfied "home-makers" published below needs no further comment.

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Yours Faithfully,
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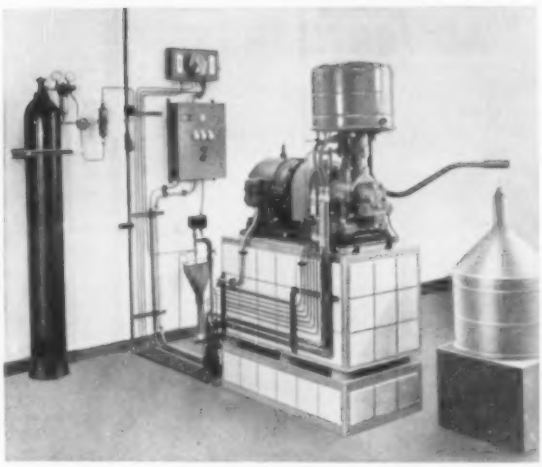
BREMEN (Germany)



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Heating, Piping & Air Conditioning
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American Management Association, New York 36, N. Y.

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American Society for Metals, Cleveland 3, Ohio

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Temple Press, Ltd., London, E. C. 1

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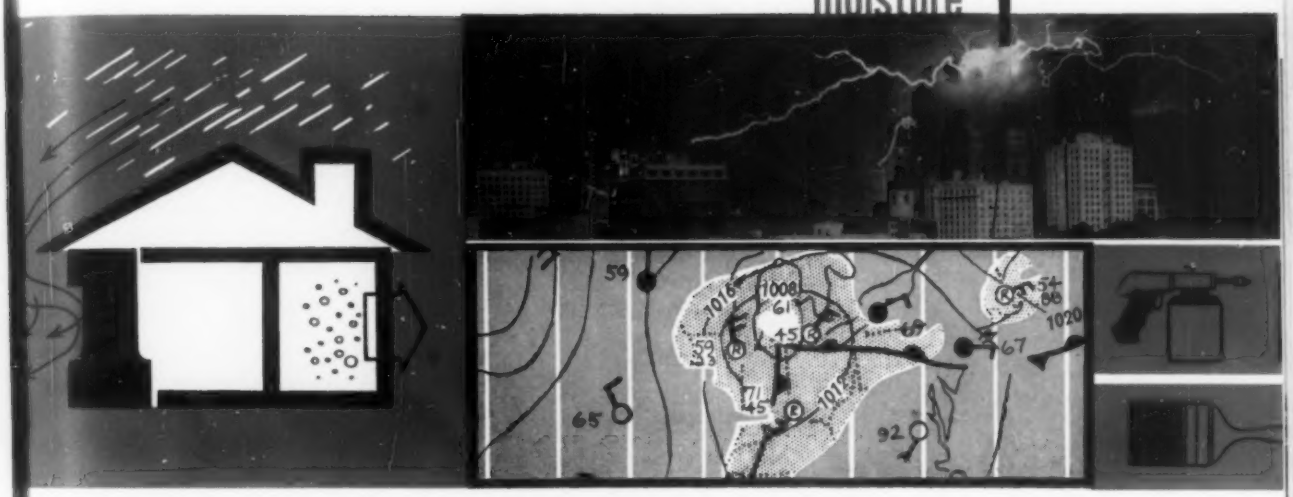
One way street for moisture



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1959

WHAT'S HIS LINE?

THE OBJECTS in the picture weren't put in just to confuse you. They're a clue. All of them are made wholly or partly from the same basic raw material —the material which is the "line" in question.

What *is* this line? It's *synthetic rubber*—manufactured by the Polymer Corporation of Sarnia, Canada, under the trade name of Polysar*. The fact that the products pictured here are so varied is an indication of the increasing versatility of Polysar rubbers. There is scarcely an industry which, during the past ten years, has not benefited from their use—in product improvement, simplified manufacturing methods, reduced costs, or in the actual creation of *new* products.

The research and manufacturing techniques that enabled the Polymer Corporation to offer this uniquely versatile rubber to industry, have at the same time resulted in Canada becoming one of the world's major sources of synthetic rubber. The 25 different kinds of Polysar rubber now being produced reach almost every world market through distributors in 36 countries.

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A new book Sales Promotion That Gets Results explains how the right sales promotion strategy can make marketing activities more effective—for both industrial and consumer goods. 259 pages, $6.50. (McGraw-Hill Book Co. Inc., 330 West 42nd Street, New York 36, N. Y.) . . . Reporting Sales Data Effectively provides a comprehensive view of efficient sales reporting. A collection of 175 sales forms now being used by U.S. firms is included. 224 pages, $12.00. (American Management Association, 1515 Broadway, New York 36, N. Y. U.S.A.)

Comparing Companies

Interfirm Comparison for Management shows—by means of practical examples—how this technique works, and lists more than 300 comparisons conducted in various countries. (See "Management Methods," on another page in this issue.) 78 pages, $2.45 or 17/6d. (British Institute of Management, Management House, 80 Fetter Lane, London EC4, England.)

Tourism—Trade—Technology

This is Japan-1959—a beautifully illustrated book—contains articles on Japan's progress toward political stability, technological advances, current affairs, and economic trends. 392 pages, $7.25. (Japan Publications Trading Co. Ltd., Central P.O. Box 722, Tokyo, Japan) . . . Barclays Bank has published an exporters' guide to the South African market. (Barclays Bank D.C.O., 54 Lombard Street, London EC3, England) . . . The International Plastics Directory lists over 10,000 producers of plastics raw materials in 69 countries. A German-English-French dictionary of plastics terms is included. 1056 pages, $18.00. (Verlag fuer Internationale Wirtschaftsliteratur GmbH, P.O.B. 108, Zurich 47, Switzerland)

The Battle For Control

If the story of British Aluminium (see page 14) intrigued you, Bid for Power—which describes some of the most famous battles for corporate control fought in the past few years—will give you an idea of what goes on in the mind of the shrewd tycoon plotting a take-over. $3.50 or 25s. (Elek Books, 14 Great James Street, London WC1, England)

Evaluating Technical Information

Technical information and the Smaller Firm describes the results of a survey on the uses of and need for technical information in the small or medium-sized company. Over 2,000 European and U.S. firms were interviewed. 350 frs. (European Productivity Agency, 3 rue Andre Pascal, Paris 16e, France)

Bulletins from Industry

New information on Materials Handling: Book 2716 will aid you in selecting the right belt conveyor idler to meet your operating requirements. (Link Belt Company, Prudential Plaza, Chicago 1, Ill., U.S.A.) . . . Detailed information on Towmostatic Drive—a new method of instant power application fór fork lift trucks—is given in Bulletin No. SP-24. (Towmotor Corp., 1226 East 152nd Street, Cleveland 10, Ohio, U.S.A.)

YOU & Personal Affairs

English—Spanish, Arabic—Without Tears

You are planning a business trip abroad, but you cannot speak the foreign language fluently. What is the best way to learn?

Self-teaching aids—disks, tape-recordings, books—can be a great help. But they cannot compare to a language school. There are now schools in almost every major city, offering classes and private lessons.

Courses average 100 hours in length. You can take your two-hour lessons as you want—daily, once or twice a week, and so on. There are shorter courses for people who are pressed for time.

Most schools use the "oral" or "direct" method, which is based on oral practice. (Berlitz is the best-known exponent.)

You learn the language as a child learns to speak, by simply listening to and reproducing sound. Meaning is learned by "experience"—through objects in the room, pictures and charts, actions and acting.

You will repeat phrases over and over until your pronunciation and intonation are perfect. The teacher will speak slowly at first, but never unnaturally. Not a word is spoken in your own language.

Take English, for example. At first you might not understand a phrase like "Isthisabookorapencil?" But be patient: You are learning ordinary, elided speech.

Question and answer is a favorite technique. "Did you put the book on the table?" "No, I didn't," "Yes, I did," etc. Soon you will reply automatically.

Grammar is an ugly word to oral method people: The student learns it "in spite of himself."

Keep in mind that language school is a good place to learn business and trade terms. A good instructor understands the businessman's needs.

Another point: The difference between accents is often exaggerated. If you are learning English with a British accent, do not worry about being understood in the States. But if this does worry you, note that recordings with both American and British voices will soon be on the market.

I'm Sorry, Sir, the Manager Is on Safari

Your secretary might hesitate to say it. But big-game hunting in Africa is becoming a popular vacation sport for businessmen.

Many, in fact, are aiming cameras instead of guns. In Uganda's Queen Elizabeth Park, you can even rent a drive-it-yourself car and go on a "sight-seeing safari" alone.

A hunting safari is still expensive. A month's expedition for two usually runs to the equivalent of about $6,000, reports *The Wall Street Journal.*

Basic cost is about $3,500 for two. This includes a guide, transport, food, and lodging. But for a really elegant safari, there are extras like personal servants, spring beds, daily laundry service.

A basic hunting license costs $140 (in Kenya). Add $210 for one elephant, $280 for a second, $70 for a lion or leopard.

To get in touch with a safari outfitter, write to the East Africa Tourist Travel Association in Nairobi, Kenya.

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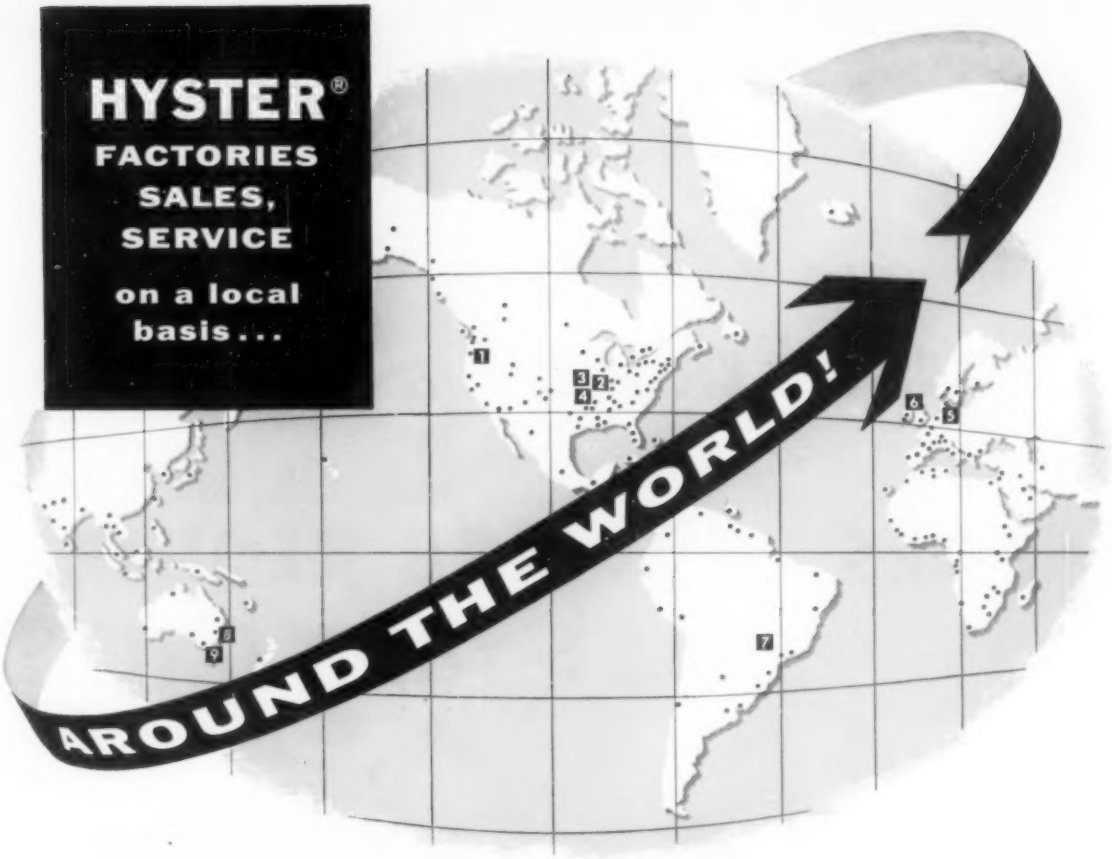

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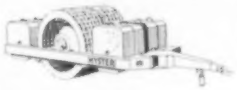

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